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# BRIGHAM YOUNG UNIVERSITY BULLETIN

# The Graduate School Catalog

## 1966-1967

For information, write to the offices listed below in care of Brigham Young University, Provo, Utah 84601.

| | |
|---|---|
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| General Information | Dean of the Graduate School |
| Publications | Office of University Publications |
| Scholarships and Fellowships | Dean of the Graduate School |
| Student Employment | Placement Center |
| Student Housing | Office of Student Housing |
| Summer School | Director of Summer School |

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Vol. 63 Provo, Utah 84601 March 1, 1966 No. 6

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# *Brigham Young University Bulletin*

**Graduate School Issue**

**1966-67**

Published by
**Brigham Young University**
Provo, Utah

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# University Calendar

Although as accurate as possible at the time of the printing of this catalog, the calendar is subject to change at the discretion of the University administration.

## 1966-67

## Summer Session 1966

**May 31 (Tuesday):** Final date for submitting admissions applications for Summer Session, 1966.

**June 13 (Monday):** Registration.

**June 14 (Tuesday):** First Term begins.

**July 4 (Monday):** National holiday observed.

**July 15 (Friday):** First Term ends.

**July 16 (Saturday):** Second Term registration.

**July 18 (Monday):** Second Term begins—registration.

**July 25 (Monday):** State holiday observed.

**July 29 (Friday):** Last day on which a candidate for August commencement must have passed the final oral exam. (An approved copy of the thesis or dissertation must be submitted to the Office of the Graduate Dean two weeks before the final oral exam.)

**August 5 (Friday):** Last day on which a candidate for August commencement must have a thesis binding receipt in the Office of the Graduate Dean.

**August 19 (Friday):** Second Term ends—Commencement Exercises.

## Fall Semester

**July 30 (Saturday):** Final date for submitting admissions applications for Fall Semester 1966-67.

**September 8, 9 (Thursday, Friday):** Utah Conference on Higher Education.

**September 12, 13 (Monday, Tuesday):** Preschool faculty conference.

**September 15 (Thursday):** New-student registration.

**September 16, 17 (Friday, Saturday):** Registration.

**September 19 (Monday):** Class instruction begins.

**September 30 (Friday):** Last day on which late registration may occur for Fall Semester and for adding and dropping classes.

**November 5 (Saturday):** Homecoming.

**November 11 (Friday):** Midsemester registration for students released from missions and from active duty with the Armed Services since the close of late registration.

**November 24, 25 (Thursday, Friday):** Thanksgiving recess.

**December 16 (Friday):** Last day of classes before Christmas recess.

**January 3 (Tuesday):** Classes resume after Christmas recess.

**January 16 (Monday):** Last day for payment of $20 graduation fee for May Commencement.

**January 16, 17 (Monday, Tuesday):** End of formal class period for Fall Semester. Final examinations may not be given before January 18.

**January 18, 19, 20, 21, 23, 24, 25 (Wednesday, Thursday, Friday, Saturday, Monday, Tuesday, Wednesday):** Fall Semester examination period.

## Spring Semester

**January 20 (Friday):** Final date for submitting admissions applications for Spring Semester 1967.

**January 30, 31 (Monday, Tuesday):** Registration for all new and regular students.

**February 1 (Wednesday):** Class instruction begins.

**February 15 (Wednesday):** Last day on which late registration may occur for Spring Semester and for adding and dropping classes.

**March 15 (Wednesday):** Last day for payment of $20 graduation fee for August commencement.

**March 24 (Friday):** Midsemester registration for students released from missions and from active duty with the Armed Services since the close of late registration.

**May 3 (Wednesday):** Y Day.

**May 5 (Friday):** Last day on which a candidate for May commencement must have passed the final oral exam. (An approved copy of the thesis or dissertation must be submitted to the Office of the Graduate Dean two weeks before the final oral exam.)

**May 12 (Friday):** Last day on which a candidate for May commencement may submit a thesis binding receipt in the Office of the Graduate Dean.

**May 16, 17 (Tuesday, Wednesday):** End of formal class periods for Spring Semester. Final examinations may not be given before May 18.

**May 18, 19, 20, 22, 23, 24, 25 (Thursday, Friday, Saturday, Monday, Tuesday, Wednesday, Thursday):** Spring Semester final examinations.

**May 26 (Friday):** Commencement Exercises.

J. Reuben Clark, Jr., Library

# *Administration and Faculty*

## Board of Trustees of Brigham Young University

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HUGH B. BROWN ..... Vice-President
JOSEPH FIELDING SMITH ..... Vice-President
THORPE B. ISAACSON ..... Vice-President

HAROLD B. LEE
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RICHARD L. EVANS
HOWARD W. HUNTER
GORDON B. HINCKLEY
THOMAS S. MONSON
BOYD K. PACKER
MARION D. HANKS
A. THEODORE TUTTLE
JOHN H. VANDENBERG

CLYDE D. SANDGREN, Secretary

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THORPE B. ISAACSON
HAROLD B. LEE
DELBERT L. STAPLEY
MARION G. ROMNEY
LEGRAND RICHARDS
HOWARD W. HUNTER
GORDON B. HINCKLEY
BOYD K. PACKER
MARION D. HANKS
CLYDE D. SANDGREN, SECRETARY

## Administrative Council

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Academic Vice-President ..... Earl C. Crockett
Vice-President, Auxiliary and Communication Services ..... Ben E. Lewis
Vice-President and General Counsel ..... Clyde D. Sandgren
Administrative Assistant and Director of University Relations ..... Stephen R. Covey
Comptroller ..... Joseph T. Bentley
Dean of Students ..... J. Elliot Cameron
Dean of Admissions and Records ..... William R. Siddoway
Director, University Development ..... Raymond E. Beckham
Dean of the College of Social Sciences ..... John T. Bernhard

## Graduate School

Dean of the Graduate School ..... Wesley P. Lloyd

## Deans of Colleges

Biological and Agricultural Sciences ..... Rudger H. Walker
Business ..... Weldon J. Taylor
Education ..... Antone K. Romney
Family Living ..... Virginia F. Cutler
Fine Arts and Communications ..... Conan E. Mathews
General College ..... Lester B. Whetten
Humanities ..... Bruce B. Clark
Industrial and Technical Education ..... Ernest C. Jeppsen
Nursing ..... Linnea Morrison
Physical and Engineering Sciences ..... Armin J. Hill
Physical Education ..... Milton F. Hartvigsen
Religious Instruction ..... B. West Belnap
Social Sciences ..... John T. Bernhard

## Deans and Directors of General Areas

Admissions and Records ..... William R. Siddoway
Division of Continuing Education ..... Harold Glen Clark
Director of Research ..... H. Tracy Hall
Director of Summer School ..... Keith R. Oakes

## Graduate Council

**Representatives of Academic Areas**

Jay V. Beck, Biological and Agricultural Sciences. Term expires September 1, 1966.
Bryce B. Orton, Business. Term expires September 1, 1966.
Robert L. Egbert, Education. Term expires September 1, 1966.
Jens J. Jonsson, Engineering Sciences. Term expires September 1, 1968.
Marion Bennion, Family Living. Term expires September 1, 1967.
Clawson Y. Cannon, Jr., Fine Arts. Term expires September 1, 1966.
M. Carl Gibson, Humanities. Term expires September 1, 1967.
DeLamar Jensen, Social Sciences. Term expires September 1, 1968.
John H. Gardner, Physical Sciences. Term expires September 1, 1967.
Israel C. Heaton, Physical Education. Term expires September 1, 1967.
Chauncey C. Riddle, Religious Instruction. Term expires September 1, 1968.

**Members at Large**

Mark K. Allen. Term expires September 1, 1966.
Dean Farnsworth. Term expires September 1, 1967.
Bertrand F. Harrison. Term expires September 1, 1967.
Howard C. Nielson. Term expires September 1, 1968.
H. Tracy Hall, Director of Research.
Wesley P. Lloyd, Dean, Graduate School, Chairman.

**Ex Officio**

Earl C. Crockett, Vice-President
S. Lyman Tyler, Director of Libraries.

## Chairmen of Departments of Instruction

Accounting ..... Bryce B. Orton
Agricultural Economics ..... Ivan L. Corbridge
Agronomy ..... W. Derby Laws

Animal Science ..... R. Phil Shumway
Archaeology ..... Ross T. Christensen
Art ..... Glen H. Turner
Bacteriology ..... Don H. Larsen
Botany ..... Earl M. Christensen
Business Education ..... Max L. Waters
Business Management ..... L. Brent Eager
Chemical Engineering Science ..... Bill J. Pope
Chemistry ..... J. Rex Goates
Child Development and Family Relationships ..... Duane M. Laws
Civil Engineering Science ..... Cliff S. Barton
Communications ..... J. Morris Richards
Dramatic Arts ..... Lael Woodbury
Economics ..... Wayne Clark
Electrical Engineering Science ..... Ferril A. Losee
English ..... Dale H. West
Food and Nutrition ..... Marion Bennion
Geography ..... Marion T. Millett
Geology ..... Lehi F. Hintze
Graduate Department of Library Science, Director ..... H. Thayne Johnson
Graduate Education ..... Robert L. Egbert
Health and Safety Education ..... Ray Watters
History ..... Eugene E. Campbell
Industrial Education ..... Edwin C. Hinckley
Institute of Government Service, Director ..... Stewart L. Grow
Languages ..... R. Max Rogers
Master of Business Administration, Acting Director ..... Robert Daines
Mathematics ..... Kenneth L. Hillam
Mechanical Engineering Science ..... Milton G. Wille
Music ..... Crawford Gates
Physical Education for Men ..... David D. Geddes
Physical Education for Women ..... Leona Holbrook
Physics ..... John H. Gardner
Political Science ..... John T. Bernhard
Psychology ..... Robert J. Howell
Recreation Education ..... Israel C. Heaton
Religious Instruction: Graduate Studies ..... Chauncey C. Riddle
Sociology and Anthropology ..... Joseph N. Symons
Speech ..... Morris M. Clinger
Statistics ..... Dale Richards
Zoology and Entomology ..... A. Lester Allen

## The Faculty of the Graduate School

The faculty of the Graduate School consists of members of the general faculty who are approved by the dean of the Graduate School from among those who hold the rank of professor or associate professor, or assistant professor with a doctoral degree. For special reason related to exceptional qualification, the Graduate Council is authorized to appoint to the Graduate Faculty a member who does not hold the doctoral degree.

**George M. Addy** ..... Associate Professor of History (1957)
B.A., M.A., Brigham Young University, 1948, 1950; Ph.D., Duke University, 1957.

**Thomas G. Alexander** ..... Assistant Professor of History (1964)
B.S., M.S., Utah State University, 1960, 1961; Ph.D., University of Cailfornia at Berkeley, 1965.

**A. Lester Allen** ..... Professor of Zoology (1954)
B.A., Ph.D., University of California at Los Angeles, 1946, 1951.

**James B. Allen** ..... Associate Professor of History (1963)
B.S., Utah State University, 1954; M.A., Brigham Young University, 1956; Ph.D. University of Southern California, 1963.

**Mark K. Allen** ..... Professor of Psychology (1946)
B.A., Brigham Young University, 1926; M.A., Ph.D., Stanford University, 1935, 1955.

**Stephen L. Alley** ..... Professor of Educational Philosophy (1956)
B.S., M.S., University of Utah, 1947, 1951; Ed.D. Harvard University, 1958.

**Dorald M. Allred** ..... Associate Professor of Zoology and Entomology (1956)
B.A., M.A., Brigham Young University, 1950, 1951; Ph.D. University of Utah, 1954.

**R. Chase Allred** ..... Professor of Agronomy (1955)
B.S., Brigham Young University, 1948; M.S., Kansas State College, 1949; Ph.D. University of Nebraska, 1952.

**Alan R. Anderson** ..... Assistant Professor of Personnel and Guidance (1962)
B.S., B.Ed., University of Alberta 1952, 1953; Ph.D., Brigham Young University, 1965.

**C. Dixon Anderson** ..... Associate Professor of Spanish (1956)
B.A., Brigham Young University, 1953; M.A., Ph.D., University of Texas, 1955, 1965.

**D. Chris Anderson** ..... Assistant Professor of Psychology (1965)
B.S., M.A., Ph.D., University of Portland, 1956, 1961, 1964.

**Keith P. Anderson** ..... Professor of Chemistry (1953)
B.A., Brigham Young University, 1946; Ph.D., Cornell University, 1950.

**Richard L. Anderson** ..... Professor of History and Scripture (1955)
B.A., M.A., Brigham Young University, 1951, 1957; LL.B., Harvard University, 1954; Ph.D., University of California at Berkeley, 1962.

**Vernon L. Anderson** ..... Professor of German (1956)
B.A., M.A., University of Utah, 1948, 1949; Ph.D., Stanford University, 1954.

**Hyrum L. Andrus** ..... Professor of Scripture (1956)
B.S., Ricks College, 1951; M.S., Brigham Young University, 1952; D.S.S., Syracuse University, 1955.

**J. Roman Andrus** ..... Professor of Art and Education (1943)
B.S., M.S., Brigham Young University, 1942, 1943; Ed.D., University of Colorado, 1958; Art Students League, L.A. Art Institute.

**Clarence D. Ashton** ..... Associate Professor of Horticulture (1951)
B.S., Brigham Young University, 1929.

**Hyrum J. Babcock** ..... Associate Professor of Elementary Education (1954)
B.A., M.A., Ph.D., University of California, 1939, 1940, 1953.

**Milton V. Backman, Jr.** ..... Associate Professor of History of Religion (1960)
B.S., M.A., University of Utah, 1954, 1955; Ph.D., University of Pennsylvania, 1959.

**Hugh Baird** ..... Assistant Professor of Teacher Education (1963)
B.S., M.S., University of Utah, 1954, 1954; Ed.D., University of California at Berkeley, 1962.

**Bertrand L. Ball, Jr.** ..... Assistant Professor of French (1962)
B.A., University of Redlands, 1953; M.A., Ph.D., University of Southern California, 1958, 1960.

**Ariel S. Ballif** ..... Professor of Sociology (1938)
B.S., Brigham Young University, 1925; M.A., Ph.D., University of Southern California, 1937, 1945.

**Jae R. Ballif** ..... Associate Professor of Physics (1962)
B.S., Brigham Young University, 1953; M.A., Ph.D., University of California at Los Angeles, 1961, 1962.

**Blauer L. Bangerter** ..... Associate Professor of Physical Education (1953)
B.A., Brigham Young University, 1951; M.S., Ph.D., University of Utah, 1955, 1964.

**Dee H. Barker** ..... Professor of Chemical Engineering (1959)
B.S., Ph.D., University of Utah, 1948, 1951.

**J. Dean Barnett** ..... Associate Professor of Physics (1958)
B.A., Ph.D., University of Utah, 1954, 1959.

**Howard H. Barron** ..... Professor of Religious Education (1953)
B.S., M.S., Utah State University, 1943, 1950; Ed.D., University of Utah, 1953.

**Cliff S. Barton** ..... Professor of Civil Engineering (1959)
B.S., Utah State University, 1947; M.S., Ph.D., Rensselaer Polytechnic Institute, 1953, 1959.

**J. LaVar Bateman** ..... Professor of Speech (1949)
B.A., Brigham Young University, 1941; M.S., Ph.D., University of Wisconsin, 1947, 1950.

**Edith Bartholomew Bauer** ..... Professor of Educational Psychology (1945)
B.A., M.A., Brigham Young University, 1930, 1946; Ph.D., University of California at Berkeley, 1956.

**D Elden Beck** ..... Professor of Zoology and Entomology (1938)
B.A., M.A., Brigham Young University, 1929, 1930; Ph.D., Iowa State College, 1933.

**Jay V. Beck** ..... Professor of Bacteriology (1951)
B.A., M.A., Brigham Young University, 1933, 1936; Ph.D., University of California at Berkeley, 1940.

**R. DerMont Bell** ..... Associate Professor of Business Education (1957)
B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of Southern California, 1960.

**B. West Belnap** ..... Professor of Religious Education; Dean, College of Religious Instruction (1951)
B.S., Brigham Young University, 1946; M.A., Ed.D., Columbia University, 1950, 1951.

**W. Dwayne Belt** ..... Associate Professor of Secondary Education (1961)
B.A., Brigham Young University, 1952; M.A., Ed.D., Colorado State College, 1958, 1961.

**Marion Bennion** ..... Professor of Food and Nutrition (1952)
B.S., Utah State University, 1947; M.S., Teachers College, Columbia University, 1949; Ph.D., University of Wisconsin, 1956.

**Robert C. Bennion** ..... Associate Professor of Psychology (1961)
B.A., Brigham Young University, 1956; M.A., Ph.D., Ohio State University, 1959, 1961.

**Joseph T. Bentley** ..... Comptroller; Associate Professor of Accounting
B.S., M.S., Brigham Young University, 1928, 1954; C.P.A., State of Utah, 1946.

**John T. Bernhard** ..... Professor of Political Science; Dean, College of Social Sciences (1959)
B.S., Utah State University, 1941; M.A., Ph.D., University of California at Los Angeles, 1949, 1951.

**LaMar C. Berrett** ..... Assistant Professor of Religious Instruction (1963)
B.S., University of Utah, 1952; M.S., Ed.D., Brigham Young University, 1960, 1963.

**Paul Orin Berrett** ..... Associate Professor of Electrical Engineering (1964)
B.S., University of Utah, 1953; M.S., University of Southern California, 1955; Ph.D., University of Utah, 1965.

**Max J. Berryessa** ..... Professor of Elementary Education (1948)
B.S., M.S., Brigham Young University, 1948, 1949; Ed.D., Stanford University, 1959.

**Myron G. Best** ..... Assistant Professor of Geology (1965)
B.S., University of Utah, 1957; Ph.D., University of California at Berkeley, 1961.

**James L. Bills** ..... Assistant Professor of Chemistry (1962)
B.S., University of Utah, 1958; Ph.D., Massachusetts Institute of Technology, 1963.

***Harold J. Bissell** ..... Professor of Geology (1938)
B.S., Brigham Young University, 1934; M.S., Ph.D., University of Iowa, 1936, 1948.

**Angus U. Blackham** ..... Professor of Chemistry (1952)
B.A., Brigham Young University, 1949; M.A., Ph.D., University of Cincinnati, 1950, 1952.

**Robert W. Blair** ..... Assistant Professor of Linguistics (1959)
B.A., M.A., Brigham Young University, 1955, 1957; Ph.D., Indiana University, 1964.

**Robert R. Boren** ..... Assistant Professor of Speech (1961)
B.A., M.A., Brigham Young University, 1958, 1960; Ph.D., Purdue University, 1965.

**Walter D. Bowen** ..... Assistant Professor of Religious Education (1964)
B.S., M.S. Ed.D., Brigham Young University 1957, 1958, 1965.

**Reed H. Bradford** ..... Professor of Sociology (1946)
B.A., Brigham Young University, 1937; M.A., Louisiana State University, 1939; M.A., Ph.D., Harvard University, 1941, 1946.

**Merrill Kay Bradshaw** ..... Assistant Professor of Music (1957)
B.A., M.A., Brigham Young University, 1954, 1955; M.Mus., D.Mus.A., University of Illinois, 1956, 1962.

**Willard H. Bradshaw** ..... Associate Professor of Bacteriology (1961)
B.S., M.S., Brigham Young University, 1952, 1953; Ph D., University of California, 1957.

**Marion B. Brady** ..... Associate Professor of English (1965)
B.A., M.A., Brigham Young University, 1950, 1951; Ph.D., University of Utah, 1966.

**Ralph A. Britsch** ..... Professor of English (1938)
B.A., M.A., Brigham Young University, 1933, 1951.

**H. Smith Broadbent** ..... Professor of Chemistry (1946)
B.S., Brigham Young University, 1942; Ph.D., Iowa State College, 1946.

**Thomas H Brown** ..... Associate Professor of French (1959)
B.A., Brigham Young University, 1955; M.A., Ph.D., University of Illinois, 1957, 1960.

**Loren C. Bryner** ..... Professor of Chemistry (1935)
B.S., M.S., Brigham Young University, 1928, 1930; Ph.D., Iowa State College, 1934.

**Wallace Don Budge** ..... Assistant Professor of Civil Engineering (1964)
B.S., M.S., Utah State University, 1959, 1961; Ph.D., University of Colorado, 1964.

**Kenneth C. Bullock** ..... Professor of Geology (1943)
B.S., M.A., Brigham Young University, 1940, 1942; Ph.D., University of Wisconsin, 1949.

**Percy E. Burrup** ..... Professor of Educational Administration (1952)
B.S., M.S., Utah State University, 1932, 1941; Ed.D., Colorado State College of Education, 1951.

**Robert C. Burton** ..... Assistant Professor of Mathematics (1964)
B.S., Brigham Young University, 1956; Ph.D., University of North Carolina, 1963.

**Jess R. Bushman** ..... Associate Professor of Geology (1955)
B.A., Brigham Young University, 1949; Ph.D., Princeton University, 1959.

**Richard L. Bushman** ..... Assistant Professor of History (1960)
B.A., Ph.D., Harvard University, 1955, 1961.

**Eliot A. Butler** ..... Professor of Chemistry (1956)
B.S., Ph.D., California Institute of Technology, 1952, 1956.

**Sterling G. Callahan** ..... Professor of Secondary Education (1953)
B.A., Brigham Young University, 1937; M.A., George Washington University, 1947; Ed.D., University of Virginia, 1953.

**J. Elliot Cameron** ..... Professor of Education; Dean of Students (1962)
B.S., M.S., Brigham Young University, 1949.

**Eugene E. Campbell** ..... Professor of History (1956)
B.A., M.A., University of Utah, 1939, 1940; Ph.D., University of Southern California, 1952.

**Clawson Y Cannon, Jr.** ..... Associate Professor of Music (1949)
B.M., Eastman School of Music, University of Rochester, 1948; Diploma, Konservatorium Zurich,1953; B.A., M.A., Brigham Young University, 1954, 1955.

**John N. Cannon** ..... Associate Professor of Mechanical Engineering (1957)
B.S.M.E., M.S., University of Utah, 1952, 1955; Ph.D., Stanford University, 1965.

**Kenneth L. Cannon** ..... Professor of Child Development and Family Relationships (1956)
B.S., Brigham Young University, 1935; M.S., Ph.D., Iowa State College, 1948, 1954.

**Louis B. Cardon** ..... Assistant Professor of History (1960)
B.A., University of Arizona, 1950; M.A., Ph.D., University of California at Berkeley, 1957, 1965.

**Gary Carlson** ..... Associate Professor of Computer Science; Director of the Computer Research Center (1963)
B.A., M.A., Ph.D., University of California at Los Angeles, 1956, 1958, 1962.

**Melvin W. Carter** ..... Professor of Statistics (1961)
B.S., Arizona State University, 1952; M.S., Ph.D., North Carolina State, 1954, 1956.

**Arthur O. Chapman** ..... Associate Professor of Zoology (1959)
B.A., Brigham Young University, 1941; M.A., University of Kansas, 1949; Ph.D., University of Nebraska, 1953.

**Thomas E. Cheney** ..... Professor of English (1945)
B.S., Utah State University, 1930; M.A., University of Idaho, 1936.

**Dean C. Christensen** ..... Professor of Education (1957)
B.S., M.S., Utah State University, 1938, 1948; Ed.D., University of Oregon, 1957.

**Earl M. Christensen** ..... Professor of Botany (1949)
B.S., M.S., University of Utah, 1947, 1949; Ph.D., University of Wisconsin, 1954.

**Edward L. Christensen** ..... Professor of Business Management (1953)
B.S., M.S., Ph.D., University of Utah, 1938, 1939, 1953.

**James J. Christensen** ..... Professor of Chemical Engineering (1957)
B.S., M.S., University of Utah, 1953, 1956; Ph.D., Carnegie Institute of Technology, 1957.

**Ross T. Christensen** ..... Associate Professor of Archaeology (1952)
B.A., M.A., Brigham Young University, 1943, 1947; Ph.D., University of Arizona, 1956.

**Henry N. Christiansen** ..... Associate Professor of Civil Engineering (1965)
B.S., Utah State University, 1957; M.S., Ph.D., Stanford University, 1958, 1962.

**John R. Christiansen** ..... Professor of Sociology (1957)
B.S., M.S., Utah State University, 1949, 1952; Ph.D., University of Wisconsin, 1955.

**Bruce B. Clark** ..... Professor of English; Dean, College of Humanities (1950)
B.A., University of Utah, 1943; M.A., Brigham Young University, 1948; Ph.D., University of Utah, 1951.

**Dwight P. Clark** ..... Assistant Professor of Chemical Engineering (1964)
B.S., University of Utah, 1960; Ph.D., Oregon State University, 1965.

**Harold Glen Clark** ..... Professor of Education; Dean of Continuing Education (1946)
B.S., Brigham Young University, 1928; M.S., University of Southern California, 1934; Ed.D., George Washington University, 1942.

**Herald R. Clark** ..... Professor of Finance and Banking (1913)
B.A., Brigham Young University, 1918; M.B.A., University of Washington, 1924.

**Hoover W. Clark** ..... Assistant Professor of French (1964)
B.A., M.A., Brigham Young University, 1954, 1958; Ph.D., Syracuse University, 1964.

**J. Reuben Clark, III** ..... Professor of French and Classical Languages (1941)
B.A., University of Utah, 1934.

**James R. Clark** ..... Professor of Religious Education (1938)
B.A., M.A., Brigham Young University, 1936, 1944; Ed.D., Utah State University, 1958.

**Marden J. Clark** ..... Professor of English (1949)
B.A., M.A., Brigham Young University, 1948, 1949; Ph.D., University of Washington, 1957.

**Monroe H. Clark** ..... Associate Professor of Philosophy of Education and Guidance (1945)
B.A., Columbia University, 1923; M.A., Brigham Young University, 1927.

**Wayne W. Clark** ..... Associate Professor of Economics (1962)
B.A., Brigham Young University, 1952; Ph.D., Texas A&M, 1960.

**A. John Clarke** ..... Professor of Education (1938)
B.S., M.S., Brigham Young University, 1938, 1942; Ed.D., Colorado University, 1950.

**John C. Clegg** ..... Associate Professor of Electrical Engineering (1961)
B.S., M.S., Ph.D., University of Utah, 1949, 1954, 1957.

**Morris M. Clinger** ..... Associate Professor of Speech (1936)
B.A., M.A., Brigham Young University, 1932, 1946; Ph.D., University of Minnesota, 1963.

**Coran L. Cluff** ..... Assistant Professor of Chemistry (1960)
B.S., Arizona State University, 1952; M.S., Ph.D., University of Michigan, 1955, 1961.

**Lane A. Compton** ..... Professor of Physical Science Education (1953)
B.S., M.S., Ed.D., University of Utah, 1943, 1951, 1955.

**Merlin D. Compton** ..... Associate Professor of Spanish (1964)
B.A., M.A., Brigham Young University, 1952, 1954; Ph.D., University of California at Los Angeles, 1959.

**Ivan L. Corbridge** ..... Professor of Agricultural Economics (1952)
B.A., Utah State University, 1946; M.S., University of Chicago, 1948; Ph.D., Washington State College, 1952.

**Milford Cottrell** ..... Assistant Professor of Secondary Education (1964)
B.A., University of Wyoming, 1948; M.S., Ed.D., Brigham Young University, 1956, 1962.

**Richard O. Cowan** ..... Associate Professor of History of Religion (1961)
B.A., Occidental College, 1958; M.A., Ph.D., Stanford University, 1959, 1961.

**Soren F. Cox** ..... Assistant Professor of English (1955)
B.A. M.A., Brigham Young University, 1952, 1956; Ph.D., University of Minnesota, 1964.

**John K. Crnkovic** ..... Associate Professor of Education (1956)
B.A., Williamette University, 1930; M.A., University of Michigan, 1940; Ed.D., Arizona State College, 1956.

**Earl C. Crockett** ..... Academic Vice-President of the University; Professor of Economics (1957)
B.S., University of Utah, 1927; Ph.D., University of California, 1931.

**Evan M. Croft** ..... Associate Professor of Business Education (1936)
B.S., University of Utah, 1929; M.S., University of Southern California, 1940.

**Bert P. Cundick** ..... Assistant Professor of Psychology (1962)
B.A., M.S., University of Utah, 1957, 1959; Ph.D., Ohio State University, 1962.

**Virginia F. Cutler** ..... Professor of Home Economics; Dean, College of Family Living (1961)
B.S., University of Utah, 1926; M.A., Stanford University, 1937; Ph.D., Cornell University, 1946.

**Delva Daines** ..... Professor of Elementary Education (1955)
B.S., M.S., Utah State University, 1940, 1947; Ed.D., Washington State University, 1956.

**Philip B. Daniels** ..... Associate Professor of Psychology (1961)
B.S., M.S., Brigham Young University, 1954, 1957; Ph.D., Harvard University, 1962.

**Alexander B. Darais** ..... Assistant Professor of Art (1954)
B.S., Brigham Young University, 1948; M.F.A., Claremont Graduate School, 1952.

**J. Kenneth Davies** ..... Professor of Economics (1953)
B.S., Marquette University, 1945; M.S., Brigham Young University, 1950; Ph.D., University of Southern California, 1959.

**D. Evan Davis** ..... Professor of Music (1964)
B.A., University of California at Los Angeles, 1946; M. Mus., Northwestern University, 1948; Ed.D., University of Oregon, 1953.

**C. Edwin Dean** ..... Associate Professor of Mathematics (1949)
B.S., M.S., Brigham Young University, 1947, 1952; M.S., University of Michigan, 1955.

**Daniel L. Decker** ..... Associate Professor of Physics (1958)
B.S., M.S., Brigham Young University, 1953, 1955; Ph.D., University of Illinois, 1958.

**Gerrit de Jong, Jr.** ..... Professor of Modern Languages; Dean Emeritus, College of Fine Arts (1925)
B.A., M.A., University of Utah, 1920, 1925; Ph.D., Stanford University, 1933.

**William E. Dibble** ..... Associate Professor of Physics (1961)
B.S., Ph.D., California Technology, 1954, 1960.

**Dwight R. Dixon** ..... Associate Professor of Physics (1959)
B.S., Utah State University, 1942; Ph.D., University of California, 1955.

**David M. Donaldson** ..... Professor of Bacteriology (1955)
B.S., M.S., Ph.D., University of Utah, 1950, 1952, 1954.

**Arthur A. Done** ..... Associate Professor of Business Management (1961)
B.S., M.B.A., University of Utah, 1955, 1956; Ph.D., University of Illinois, 1963.

**G. Byron Done** ..... Professor of Scripture (1956)
B.A., University of Utah, 1928; M.A., Ph.D., University of Southern California, 1937, 1939.

**Lester N. Downing** ..... Professor of Educational Psychology (1954)
B.S., M.S., Utah State University, 1947, 1949; Ed.D., Colorado State College of Education, 1951.

**Roy W. Doxey** ..... Professor of Scripture (1948)
B.A.,M.A., George Washington University, 1938, 1940.

**Willard B. Doxey** ..... Associate Professor of Economics (1956)
B.S., M.S., University of Utah, 1937, 1947; Ph.D., University of California at Berkeley, 1956.

**J. Duane Dudley** ..... Associate Professor of Physics (1956)
B.S., Brigham Young University, 1952; M.A., Rice Institute, 1953; Ph.D., University of Utah, 1959.

**James T. Duke** ..... Assistant Professor of Sociology (1963)
B.A., M.A., University of Utah, 1957, 1958; Ph.D., University of California at Los Angeles, 1963.

**William G. Dyer** ..... Professor of Sociology (1955)
B.A., M.A., Brigham Young University, 1950, 1952; Ph.D., University of Wisconsin, 1955.

**L. Brent Eagar** ..... Assistant Professor of Business Management (1959)
B.S.E.E., University of Utah, 1957; M.B.A., University of Michigan, 1959; D.B.A., University of Washington, 1965.

**Don L. Earl** ..... Professor of Music (1946)
B.A., M.A., Brigham Young University, 1940, 1947; Ph.D., Indiana University, 1952.

**E. John Eastmond** ..... Professor of Physics (1951)
B.A., Brigham Young University, 1937; Ph.D., University of California at Berkeley, 1943.

**Larre N. Egbert** ..... Assistant Professor of Zoology (1965)
B.S., Utah State University, 1959; Ph.D., California Institute of Technology, 1965.

**Robert L. Egbert** ..... Professor of Educational Psychology (1955)
B.S., M.S., Utah State University, 1947, 1948; Ph.D., Cornell University, 1949.

**Richard Grant Ellsworth** ..... Associate Professor of English (1958)
B.A., M.A., Brigham Young University, 1951, 1952; Ph.D., University of Maryland, 1958.

**Glenn L. Enke** ..... Professor of Civil Engineering (1962)
B.S., University of California, 1928.

**LeRoy G. Faerber** ..... Assistant Professor of Business Management (1964)
B.S., M.B.A., University of Utah, 1958, 1959; D.B.A., University of Washington, 1964.

**Dean B. Farnsworth** ..... Professor of English (1953)
B.A., M.A., University of Utah, 1946, 1947; Ph.D., University of California at Berkeley, 1950.

**Lee W. Farnsworth** ..... Assistant Professor of Political Science (1964)
B.A., M.A., University of California at Berkeley, 1957, 1960; Ph.D., Claremont College, 1963.

***Raymond B. Farnsworth** ..... Professor of Agronomy (1946)
B.S., Brigham Young University, 1937; M.S., Massachusetts State College, 1938; Ph.D., Ohio State University, 1941.

**J. Earl Faulkner** ..... Assistant Professor of Statistics (1962)
B.S., Utah State University, 1950; M.S., Kansas State College, 1952; Ph.D., University of Minnesota 1964.

**Lawrence Fearnley** ..... Associate Professor of Mathematics (1957)
B.Sc., London University, 1953; Ph.D., University of Utah, 1959.

**D. Allan Firmage** ..... Professor of Engineering (1955)
B.S.C.E., University of Utah, 1940; M.S., Massachusetts Institute of Technology, 1941.

**Sherman K. Fitzgerald** ..... Associate Professor of Sociology (1963)
B.S., M.S., Brigham Young University, 1948, 1951; Ph.D. Cornell University, 1952.

**Royce P. Flandro** ..... Associate Professor of Secondary Education 1953)
B.S., M.S., University of Utah, 1948, 1950; Ed.D., University of Indiana, 1957.

**Harvey J. Fletcher** ..... Professor of Mathematics (1953)
B.S. Massachusetts Institute of Technology, 1944; M.S., California Institute of Technology, 1948; Ph.D., University of Utah, 1954.

**Marvin H. Folsom** ..... Associate Professor of German (1961)
B.A., M.A., Brigham Young University, 1956, 1957; Ph.D., Cornell University, 1961.

**Herbert H. Frost** ..... Associate Professor of Zoology (1960)
B.A., M.A., Brigham Young University, 1941, 1947; Ph.D., Cornell University, 1955.

**Dean K. Fuhriman** ..... Professor of Civil Engineering (1954)
B.S., M.S., Utah State University, 1941, 1950; Ph.D., University of Wisconsin, 1952.

**Andrew L. Gardner** ..... Associate Professor of Physics (1964)
B.S., Utah State University, 1940; Ph.D., University of California at Berkeley, 1955.

**John H. Gardner** ..... Professor of Physics (1949)
B.S., Utah State University, 1943; M.A., Ph.D., Harvard University, 1947, 1950.

**Byron W. Gassman** ..... Associate Professor of English (1960)
B.A., Brigham Young University, 1955; M.A., Ph.D., University of Chicago, 1956, 1960.

**Crawford Gates** ..... Professor of Music (1948)
B.A., San Jose State College, 1944; M.A., Brigham Young University, 1948; Ph.D., Eastman School of Music, University of Rochester, 1954.

**David D. Geddes** ..... Professor of Health and Physical Education for Men (1952)
B.S., M.S., Brigham Young University, 1950, 1952; Ph.D., University of Southern California, 1959.

**Burton C. Gee** ..... Assistant Professor of Mathematics (1960)
B.S., Brigham Young University, 1951; M.S., Ed.D., Oregon State University, 1958, 1965.

**M. Carl Gibson** ..... Associate Professor of Spanish (1949)
B.A., M.A., Brigham Young University, 1947, 1949; Ph.D., University of Oregon, 1960.

**Gurcharan S. Gill** ..... Assistant Professor of Mathematics (1960)
B.S., Brigham Young University, 1958; M.S., Ph.D., University of Utah, 1960, 1965.

**Preston R. Gledhill** ..... Professor of Dramatic Arts (1947)
Degré Supérieur, La Sorbonne, 1938; B.A., Brigham Young University, 1939; M.A., Louisiana State University, 1940; Ph.D., University of Wisconsin, 1951.

**J. Rex Goates** ..... Professor of Chemistry (1947)
B.S., Brigham Young University, 1942; Ph.D., University of Wisconsin, 1947.

**A. Harold Goodman** ..... Professor of Music (1960)
B.A., University of Arizona, 1947; M.A., Ed.D., University of Southern California, 1951, 1960.

**John A. Green** ..... Associate Professor of French (1964)
B.A., M.A., Brigham Young University, 1954, 1955; Ph.D., University of Washington, 1960.

**Alan H. Grey** ..... Assistant Professor of Geography (1964)
B.A., Brigham Young University, 1959; M.S., Ph.D., University of Wisconsin, 1960, 1963.

**Stewart L. Grow** ..... Professor of History and Political Science; Director, Institute of Government Service (1947)
B.S., M.S., Brigham Young University, 1935, 1948; Ph.D., University of Utah, 1954.

**Clark J. Gubler** ..... Professor of Chemistry (1958)
B.A., Brigham Young University, 1939; M.A., Utah State University, 1941; Ph.D., University of California, 1954.

**Richard L. Gunn** ..... Professor of Art and Education (1948)
B.S., M.S., Brigham Young University, 1947, 1950; Ed.D., Stanford University, 1955.

**LeRoy R. Hafen** ..... Professor of History (1954)
B.A., Brigham Young University, 1916; M.A., University of Utah, 1919; Ph.D., University of California, 1924; Litt.D., University of Colorado, 1935.

**Wayne B. Hales** ..... Professor of Physics and Mathematics (1930)
B.A., Brigham Young University, 1916; M.A., University of Utah, 1922; Ph.D., California Institute of Technology, 1926.

**H. Tracy Hall** ..... Professor of Chemistry, Director of the Research Division (1955)
B.S., M.S., Ph.D., University of Utah, 1942, 1943, 1948.

**John R. Halliday** ..... Professor of Music (1936)
B.A., M.A., Brigham Young University, 1935, 1936; Ph.D., Eastman School of Music, University of Rochester, 1941.

**W. Kenneth Hamblin** ..... Associate Professor of Geology (1963)
B.A., M.S., Brigham Young University, 1953, 1954; Ph.D., University of Michigan, 1958.

**Richard W. Hanks** ..... Assistant Professor of Chemical Engineering (1963)
B.E., Yale University, 1957; Ph.D., University of Utah, 1960.

**George H. Hansen** ..... Professor of Geology and Geography (1927)
B.S., Utah State University, 1918; M.S., Ph.D., George Washington University, 1925, 1927.

**Harold I. Hansen** ..... Professor of Dramatic Arts (1952)
B.S., Utah State University, 1937; M.A., Ph.D., State University of Iowa, 1940, 1949.

**Terrence L. Hansen** ..... Professor of Spanish (1960)
B.A., University of Utah, 1946; M.A., Ph.D., Stanford University, 1948, 1950.

**Blaine C. Hardy** ..... Assistant Professor of Educational Philosophy (1961)
B.A., Washington State University, 1957; M.A., Brigham Young University, 1959; Ph.D., Wayne State University, 1963.

**Kenneth R. Hardy** ..... Professor of Psychology (1954)
B.A., M.A., University of Utah, 1948, 1949; Ph.D., University of Michigan, 1954.

**Frank W. Harmon** ..... Assistant Professor of Elementary Education (1963)
B.S., M.S., University of Utah, 1952, 1956; Ed.D., Columbia University, 1964.

**Callis R. Harms** ..... Associate Professor of Educational Administration (1960)
B.S., M.Ed., Brigham Young University, 1952, 1956; Ed.D., Arizona State University, 1961.

**James M. Harris** ..... Associate Professor of Educational Psychology (1955)
B.S., M.S., Utah State University, 1952, 1953; Ph.D., Cornell University, 1955.

**John B. Harris** ..... Assistant Professor of English (1958)
B.A., M.A., Brigham Young University 1955, 1956; Ph.D., Wayne State University, 1965.

**Bertrand F. Harrison** ..... Professor of Botany (1929)
B.S., M.S., Brigham Young University, 1930, 1931; Ph.D., University of Chicago, 1937.

**B. Kent Harrison** ..... Assistant Professor of Physics (1964)
B.S., Brigham Young University, 1955; M.A., Ph.D., Princeton University, 1958, 1959.

**Betty D. Harrison** ..... Assistant Professor of Educational Psychology (1961)
B.S., M.S., Ph.D. Brigham Young University 1959, 1960, 1965.

**Charles J. Hart** ..... Professor of Recreation and of Physical and Health Education (1925)
B.S., Utah State University, 1922; M.A., Ed.D., New York University, 1932, 1945.

**David K. Hart** ..... Assistant Professor of Political Science (1960)
B.S., Brigham Young University, 1957; M.A., University of California at Berkeley, 1960; Ph.D., Claremont Graduate School, 1965.

**Edward L. Hart** ..... Professor of English (1952)
B.S., University of Utah, 1939; M.A., University of Michigan, 1941; D. Phil., Oxford University (England), 1950.

**Milton F. Hartvigsen** ..... Professor of Physical Education; Dean, College of Physical Education (1956)
B.S., M.Ed., Utah State University, 1930, 1939; Ed.D., University of California at Los Angeles, 1956.

**Stephen J. Hawkes** ..... Assistant Professor of Chemistry (1964)
B.S., Ph.D., Northern Polytechnic University of London, 1953, 1963.

**Richard T. Hawkins** ..... Associate Professor of Chemistry (1959)
B.A., Brigham Young University, 1951; Ph.D., University of Illinois, 1959.

**C. Lynn Hayward** ..... Professor of Zoology (1930)
B.S., M.S., Brigham Young University, 1927, 1931; Ph.D., University of Illinois, 1941.

**Howard S. Heaton** ..... Assistant Professor of Mechanical Engineering (1963)
B.S., University of Southern California, 1957; M.S., Ph.D., Stanford University, 1959, 1963.

**Israel C. Heaton** ..... Professor of Recreation Education (1956)
B.S., M.S., Utah State University, 1940, 1941; Re.D., University of Indiana, 1955.

**Wayne R. Herlin** ..... Assistant Professor of Educational Psychology (1964)
B.A., University of Utah, 1953; M.A., Stanford, 1956; Ph.D., University of Utah, 1963.

**Wilford M. Hess** ..... Assistant Professor of Botany (1962)
B.S., Brigham Young University, 1957; M.S., Ph.D., Oregon State University, 1960, 1962.

**Armin J. Hill** ..... Professor of Physics; Dean, College of Physical and Engineering Sciences (1957)
B.S., M.S., Montana State College, 1932, 1938; M.S., Ph.D., California Institute of Technology, 1949, 1950.

**Max W. Hill** ..... Associate Professor of Physics (1958)
B.A., Brigham Young University, 1954; Ph.D., University of California, 1959.

**Kenneth L. Hillam** ..... Associate Professor of Mathematics (1957)
B.S., M.S., University of Utah, 1949, 1956; Ph.D., University of Colorado, 1962.

**Ray C. Hillam** ..... Assistant Professor of Political Science (1960)
B.A., University of Utah, 1955; M.A., George Washington University, 1958; Ph.D., American University, 1964.

**H. Gill Hilton** ..... Assistant Professor of Statistics (1962)
B.S., Brigham Young University, 1957; M.S., Ph.D., North Carolina State College, 1960, 1962.

**Edwin C. Hinckley** ..... Associate Professor of Industrial Education (1963)
B.S., M.S., Oregon State University, 1950, 1956; Ed.D., Colorado State College, 1963.

**Lehi F. Hintze** ..... Professor of Geology (1955)
B.A., University of Utah, 1941; M.A., Ph.D., Columbia University, 1949, 1951.

**Leona Holbrook** ..... Professor of Physical Education (1937)
B.S., University of Utah, 1929; M.A., Ed.D., Columbia University, 1935, 1950.

**Keith H. Hoopes** ..... Associate Professor of Animal Science (1957)
B.S., Utah State University, 1957; D.V.M., State College of Washington, 1956.

**A. Burt Horsley** ..... Associate Professor of Philosophy and Religion (1956)
B.A., M.A., Brigham Young University, 1945, 1954; DdP., Münster University, 1955; Ph.D., Westphalian Welhelms Universität, Münster, Germany, 1956.

**M. Duane Horton** ..... Assistant Professor of Chemical Engineering (1963)
B.S., Ph.D., University of Utah, 1957, 1961.

**William A. Hoskisson** ..... Associate Professor of Bacteriology (1957)
B.S., M.S., Utah State University, 1938, 1941; Ph.D., University of Illinois, 1944.

**Robert J. Howell** ..... Professor of Psychology (1952)
B.A., M.A., Ph.D., University of Utah, 1948, 1949, 1951.

**DeVerl S. Humpherys** ..... Assistant Professor of Electrical Engineering (1964)
B.S., Brigham Young University, 1955; M.S., University of Utah, 1957; Ph.D., University of Illinois, 1963.

**Paul V. Hyer** ..... Associate Professor of History (1957)
B.A., Brigham Young University, 1951; M.A., Ph.D., University of California, 1953, 1960.

**Carlton A. Infanger** ..... Assistant Professor of Agricultural Economics (1964)
B.S., M.S., Ph.D., Montana State College, 1955, 1956, 1964.

**Reed M. Izatt** ..... Professor of Chemistry (1956)
B.S., Utah State University, 1951; Ph.D., Pennsylvania State University, 1954.

**Briant S. Jacobs** ..... Professor of English (1946)
B.A., Brigham Young University, 1939; Ph.D., State University of Iowa, 1944.

**M. Wells Jakeman** ..... Professor of Archaeology (1946)
B.A., University of Utah, 1931; M.A., University of Southern California, 1932; Ph.D., University of California, 1938.

**Ronald D. Jamison** ..... Assistant Professor of Mathematics (1963)
B.S., Brigham Young University, 1957; Ph.D., University of Utah, 1965.

**August W. Jaussi** ..... Assistant Professor of Zoology (1962)
B.S., University of Idaho, 1953; M.S., Brigham Young University, 1955; Ph.D., Oklahoma State University, 1960.

**Clayne R. Jensen** ..... Associate Professor of Physical Education (1964)
B.S., M.S., University of Utah, 1952, 1956; R.E.D., Indiana University, 1963.

**De Lamar Jensen** ..... Associate Professor of History (1957)
B.A., Brigham Young University, 1952; M.A., Ph.D., Columbia University, 1953, 1957.

**Vern H. Jensen** ..... Professor of Psychology; Director of Counseling Service (1949)
B.S., M.S., Brigham Young University, 1948, 1950; Ed.D., University of Colorado, 1957.

**Owen O. Jenson** ..... Assistant Professor of Speech (1965)
B.S., Brigham Young University, 1961; M.S., Ph.D., Purdue University, 1963, 1965.

**Ernest C. Jeppsen** ..... Professor of Industrial Education; Dean, College of Industrial and Technical Education (1959)
B.S., Utah State University, 1926; M.S., Colorado State University, 1938.

**Eldred A. Johnson** ..... Associate Professor of Accounting (1955)
B.A., M.A., Brigham Young University, 1949, 1950; C.P.A., State of California, 1952.

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B.A., Brigham Young University, 1958; M.A., Ph.D., University of Utah, 1959, 1962.

**Douglas E. Jones** ..... Assistant Professor of Physics (1964)
B.S., M.S., Ph.D., Brigham Young University, 1957, 1959, 1964.

**Jens J. Jonsson** ..... Professor of Electrical Engineering (1953)
B.S.G.E., B.S.E.E., University of Utah, 1944, 1947; M.S.E.E., Ph.D., Purdue University, 1948, 1951.

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B.S., M.S., Brigham Young University, 1954, 1957; Ph.D., Oregon State University, 1964.

**Kenneth W. Karren** ..... Associate Professor of Civil Engineering (1961)
B.S., M.S., University of Utah, 1953, 1961; Ph.D., Cornell University, 1965.

**Edwin R. Kimball** ..... Professor of Physical Education (1935)
B.S., Brigham Young University, 1926; M.S., University of Southern California, 1935; Ed.D., University of Oregon, 1955.

**Elmer M. Knowles** ..... Professor of Child Development and Family Relationships (1962)
B.S., M.S., Utah State University, 1949, 1950; Ph.D., Cornell University, 1952.

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B.S., Brigham Young University, 1940; M.A., University of Nebraska, 1942; Ph.D., University of Utah, 1950.

**Kenneth M. Larsen** ..... Assistant Professor of Mathematics (1960)
B.A., University of Utah, 1950; M.A., Brigham Young University, 1956; Ph.D., University of California at Los Angeles, 1964.

**Clinton F. Larson** ..... Professor of English (1947)
B.A., M.A., University of Utah, 1943, 1947; Ph.D., University of Denver, 1956.

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B.S., M.S., Ph.D., Massachusetts Institute of Technology, 1957, 1959, 1964.

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B.A., M.A., University of Utah, 1920, 1926.

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B.S., Brigham Young University, 1939; M.S., Utah State University, 1941; Ph.D., Ohio State University, 1944.

**Harold R. Laycock** ..... Associate Professor of Music (1949)
B.A., M.A., Brigham Young University, 1937, 1947; D.M.A., University of Southern California, 1960.

**Ralph G. Laycock** ..... Associate Professor of Music (1953)
B.A., Brigham Young University, 1941; M.S., Juilliard School of Music, N.Y.C., 1948.

**Robert L. Layton** ..... Associate Professor of Geography (1954)
B.S., M.S., University of Utah, 1951, 1952; Ph.D., University of Syracuse, 1962.

**Harold W. Lee** ..... Professor of French (1937)
B.A., M.A., Brigham Young University, 1938, 1904; Ph.D., Stanford University, 1946.

**Wesley P. Lloyd** ..... Professor of Education; Dean, Graduate School (1935)
B.S., M.S., Brigham Young University, 1927, 1934; Ph.D., University of Chicago, 1937.

**Gordon M. Low** ..... Professor of Speech (1964)
B.A., M.S., University of Utah, 1949, 1950; Ph.D., University of Minnesota, 1955.

**Daniel H. Ludlow** ..... Professor of Scripture (1955)
B.S., Utah State University, 1946; M.S., Indiana University, 1953; Ed.D., Columbia University, 1955.

**Ross "J" McArthur** ..... Professor of Industrial Education (1956)
B.S., M.S., Utah State University, 1949, 1953; Ed.D., University of Missouri, 1955.

**Kent H. McKnight** ..... Professor of Botany (1947)
B.S., M.S., Brigham Young University, 1948, 1952; Ph.D., University of Michigan, 1955.

**Delbert H. McNamara** ..... Professor of Physics (1955)
B.S., Ph.D., University of California at Berkeley, 1947, 1950.

**Melvin P. Mabey** ..... Associate Professor of History and Political Science (1955)
B.S., M.A., Brigham Young University, 1947, 1953; D. Phil., Oxford University (England), 1955.

**Harold S. Madsen** ..... Assistant Professor of English (1956)
B.A., M.A., University of Utah, 1953, 1960; Ph.D., University of Colorado, 1965.

**Truman G. Madsen** ..... Professor of Philosophy (1957)
B.S., M.S., University of Utah, 1951, 1952; A.M., Ph.D., Harvard University, 1957, 1960.

**Garth L. Mangum** ..... Associate Professor of Economics (1960)
B.S., Brigham Young University, 1956; M.P.A., Ph.D., Harvard University, 1958, 1960.

**John H. Mangum** ..... Assistant Professor of Chemistry (1963)
B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., University of Washington, 1963.

**Conan E. Mathews** ..... Professor of Art; Dean, College of Fine Arts and Communications (1956)
B.A., College of Idaho, 1936; M.F.A., University of Utah, 1950.

**J. Keith Melville** ..... Associate Professor of Political Science (1957)
B.A., University of Utah, 1947; M.A., University of California, 1949; Ph.D., University of Utah, 1956.

**Charles L. Metten** ..... Associate Professor of Dramatic Arts (1962)
B.A., M.A., University of California at Los Angeles, 1951, 1952; Ph.D., State University of Iowa, 1960.

**Louis C. Midgley** ..... Assistant Professor of Political Science (1963)
B.S., M.S., University of Utah, 1954, 1957; Ph.D., Brown University, 1965.

**Albert O. Mitchell** ..... Professor of Dramatic Arts (1956)
B.S., M.S., University of Utah, 1933, 1935; Ph.D., University of Wisconsin, 1938.

**J. C. Moffitt** ..... Professor of Educational Administration (1953)
B.S., M.S., Brigham Young University, 1926, 1929; Ph.D., University of Chicago, 1940.

**J. Weldon Moffitt** ..... Professor of Psychology (1963)
B.S., Brigham Young University, 1949; M.S., University of Utah, 1950; Ph.D., University of Illinois, 1953.

**Darrel J. Monson** ..... Associate Professor of Electrical Engineering (1956)
B.S., University of Utah, 1943; M.S., University of California at Berkeley, 1952.

**Diane Monson** ..... Assistant Professor of Political Science (1964)
B.A., Radcliffe College 1958; M.A., Ph.D., New York University, 1959, 1963.

**Harold K. Moon** ..... Assistant Professor of Spanish (1963)
B.A., M.A., Brigham Young University, 1957, 1959; Ph.D., Syracuse University, 1963.

**Glen Moore** ..... Associate Professor of Botany (1958)
B.S., Brigham Young University, 1949; Ph.D., University of Chicago, 1954.

**Alonzo J. Morley** ..... Professor of Speech (1928)
B.A., M.A., Brigham Young University, 1925, 1931; Ph.D., University of Iowa, 1935.

**Edwin B. Morrell** ..... Assistant Professor of Political Science (1961)
B.A., Brigham Young University, 1956; M.A., Ph.D., Harvard University, 1959, 1966.

**A. Reed Morrill** ..... Professor of Educational Administration (1948)
B.S., M.S., Brigham Young University, 1928, 1937; Ed.D., University of Oregon, 1948.

**Lawrence Morris** ..... Professor of Animal Science (1952)
B.S.A., University of Arizona, 1925; M.S., Texas A. & M., 1928; Ph.D., Louisiana State University, 1938.

***Darrell Moses** ..... Associate Professor of Educational Psychology (1959)
B.A., M.A., University of Utah, 1952, 1953; Ph.D., University of Southern California, 1960.

**J. Joel Moss** ..... Professor of Child Development and Family Relationships (1961)
B.S., M.S., Brigham Young University, 1948, 1949; Ph.D., University of North Carolina, 1954.

**Joseph R. Murdock** ..... Associate Professor of Botany (1952)
B.S., M.S., Brigham Young University, 1949, 1951; Ph.D., Washington State University, 1956.

**Joseph R. Murphy** ..... Associate Professor of Zoology (1960)
B.A., M.A., Brigham Young University, 1950, 1951, Ph.D., University of Nebraska, 1957.

**Merlin G. Myers** ..... Assistant Professor of Anthropology (1963)
B.A., Brigham Young University, 1951; Ph.D., University of Cambridge, 1963.

**Neils P. Neilson** ..... Professor of Physical Education (1964)
B.S., Utah State University, 1919; M.A., Ph.D., University of California at Berkeley, 1922, 1936.

**Glen T. Nelson** ..... Professor of Economics (1954)
B.S., M.S., Utah State University, 1942, 1948; Ph.D., University of Illinois, 1950.

**H. Mark Nelson** ..... Associate Professor of Physics (1959)
B.S., M.S., Brigham Young University, 1953, 1954; Ph.D., Harvard University, 1959.

**K. LeRoi Nelson** ..... Professor of Chemistry (1956)
B.S., Utah State University, 1948; Ph.D., Purdue University, 1952.

**Hugh W. Nibley** ..... Professor of History and Religion (1946)
B.A., University of California at Los Angeles, 1934; Ph.D., University of California, 1938.

**Henry J. Nicholes** ..... Professor of Health Education (1946)
B.A., Brigham Young University, 1935; M.S., Ph.D., University of Wisconsin, 1939, 1941.

**Howard C. Nielson** ..... Professor of Statistics (1957)
B.S., University of Utah, 1947; M.S., University of Oregon, 1949; M.B.A., Ph.D., Stanford University, 1956, 1957.

**Quentin R. Nordgren** ..... Associate Professor of Music (1955)
B.A., M.A., Brigham Young University, 1942, 1950; Ph.D., Indiana University, 1955.

**Keith R. Oakes** ..... Professor of Educational Administration; Director of Summer School (1957)
B.S., M.S., Utah State University, 1940, 1948; Ed.D., University of Southern California, 1954.

**Clinton L. Oaks** ..... Professor of Business Management (1957)
B.A., Brigham Young University, 1948; M.B.A., Ph.D., Stanford University, 1950, 1955.

**John E. Ord** ..... Associate Professor of Elementary Education (1957)
B.S., Utah State University, 1940; M.S., University of Utah, 1949; Ed.D., Stanford University, 1958.

**Bryce B. Orton** ..... Professor of Accounting (1961)
B.S., Brigham Young University, 1951; M.B.A., University of Oregon, 1957; D.B.A., University of Washington, 1962.

**J. Bevan Ott** ..... Associate Professor of Chemistry (1960)
B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of California, 1959.

**Glen F. Ovard** ..... Professor of Educational Administration (1958)
B.S., M.S., Brigham Young University, 1949, 1954; Ed.D., Stanford University, 1958.

**Thane J. Packer** ..... Associate Professor of Youth Leadership (1959)
B.S., Utah State University, 1939. M.S., Brigham Young University, 1963.

***Spencer J. Palmer** ..... Associate Professor of History of Religious Instruction (1962)
B.A., Brigham Young University, 1952; M.A., Ph.D., University of California at Berkeley, 1959, 1964.

**Robert Lynn Park** ..... Assistant Professor of Animal Science (1965)
B.S., Brigham Young University, 1956; M.S., Ph.D., Cornell University, 1958, 1962.

**Robert C. Patch** ..... Associate Professor of Scripture (1959)
B.A., University of Mexico, 1945; M.Th., Ph.D., Brigham Young University, 1949, 1964.

**Edward G. Paul** ..... Assistant Professor of Chemistry (1964)
B.S., Ph.D., University of Utah, 1958, 1962.

**Glenn L. Pearson** ..... Associate Professor of Scripture (1951)
B.S., Utah State University, 1949; M.A., Brigham Young University, 1951.

**Darhl Max Pedersen** ..... Assistant Professor of Psychology (1962)
B.S., M.S., Brigham Young University, 1957, 1958; Ph.D., University of Illinois, 1962.

**Melvin J. Petersen** ..... Assistant Professor of Religious Education (1964)
B.S., M.S., Ed.D., Brigham Young University, 1948, 1955, 1964.

***Dean A. Peterson** ..... Professor of Business Education (1942)
B.S., Brigham Young University, 1938; M.S., Ed.D., University of Southern California, 1942, 1959.

**Evan T. Peterson** ..... Associate Professor of Sociology (1959)
B.S., M.S., Brigham Young University, 1952, 1953; Ph.D., University of Michigan, 1959.

**H. Donl Peterson** ..... Assistant Professor of Religious Education (1964)
B.S., M.Ed., Brigham Young University, 1954, 1960; Ed.D., Washington State University, 1965.

**W. Revell Phillips** ..... Associate Professor of Geology (1957)
B.S., M.S., Ph.D., University of Utah, 1950, 1951, 1954.

**Richard D. Poll** ..... Professor of History and Political Science (1948)
B.A., M.A., Texas Christian University, 1938, 1939; Ph.D., University of California at Berkeley, 1948.

**J. Perry Polson** ..... Associate Professor of Business Education (1952)
B.S., M.S., University of Utah, 1947, 1952; Ed.D., University of Southern California, 1961.

**Bill J. Pope** ..... Professor of Chemical Engineering (1958)
B.S., University of Utah, 1947; M.S., Ph.D., University of Washington, 1948, 1959,

***Blaine R. Porter** ..... Professor of Child Development and Family Relationships (1955)
B.S., M.A., Brigham Young University, 1947, 1949; Ph.D., Cornell University, 1952.

**Jenniev Poulson** .... Associate Professor of Housing and Home Management (1963)
B.S., Brigham Young University, 1933; M.S., Ph.D., Iowa State University, 1954, 1964.

**Jesse W. Reeder** ..... Professor of History and Political Science (1952)
B.S., M.S., Utah State University, 1934, 1937; Ph.D., Cornell University, 1952.

**Howard T. Reid** ..... Professor of Personnel and Guidance (1953)
B.A., Brigham Young University, 1940; M.S., Ed.D., University of Southern California

**Owen S. Rich** ..... Associate Professor of Communications (Radio-Television) (1950)
B.S., Brigham Young University, 1950; M.A., University of Southern California, 1953; Ed.D., Pennsylvania State University, 1963.

**Russell R. Rich** ..... Professor of History of Religion (1953)
B.S., Utah State University, 1936; M.A., Brigham Young University, 1949; Ed.D., University of Wyoming, 1955.

**Dale O. Richards** ..... Associate Professor of Statistics (1963)
B.S., Utah State University, 1950; M.S., Ph.D., Iowa State University, 1957, 1963.

**Dean Rickenbach** ..... Assistant Professor of Business Management (1963)
B.S., Brigham Young University, 1954; M.S., Stanford University, 1957; Ph.D., Indiana University, 1963.

**Chauncey C. Riddle** ..... Professor of Philosophy (1952)
B.S., Brigham Young University, 1947; M.A., Ph.D., Columbia University, 1951, 1958.

**J. Keith Rigby** ..... Professor of Geology (1953)
B.S., M.S., Brigham Young University, 1948, 1949; Ph.D., Columbia University, 1952.

**Burton W. Robinson** ..... Professor of Clinical Psychology (1955)
B.S., M.S., Utah State University, 1951; Ph.D., Purdue University, 1954.

**Donald W. Robinson** ..... Professor of Mathematics (1956)
B.S., M.A., University of Utah, 1948, 1952; Ph.D., Case Institute of Technology, 1956.

**R. Max Rogers** ..... Professor of German (1945)
B.A., M.A., Brigham Young University, 1940, 1942; Ph.D., Stanford University, 1951.

**Norma Rohde** ..... Assistant Professor of Educational Psychology; Counselor in Counseling Service (1956)
B.A., University of Utah, 1949; M.A., Columbia University, 1958; Ed.D., Brigham Young University, 1965.

**Boyd C. Rollins** ..... Associate Professor of Child Development and Family Relationships (1963)
B.S., Utah State University, 1953; M.S., Brigham Young University, 1958; Ph.D., Cornell University, 1961.

**Ralph L. Rollins** ..... Professor of Civil Engineering (1956)
B.S., M.S., Utah State University, 1941, 1949; Ph.D., Iowa State College, 1954.

**Antone K. Romney** ..... Professor of Education; Dean, College of Education (1945)
B.S., M.S., Brigham Young University, 1933, 1934; Ed.D., Stanford University, 1947.

**Elmo S. Roundy** ..... Associate Professor of Physical Education (1963)
B.S., M.Ed., Brigham Young University, 1953, 1956; Ed.D., University of California at Los Angeles, 1965.

**Richard D. Sagers** ..... Professor of Bacteriology (1958)
B.S., M.S., Brigham Young University, 1954, 1955; Ph.D., University of Illinois, 1958.

**Clyde D. Sandgren** ..... Vice-President and General Counsel; Professor of Business Law (1954)
B.S., Brigham Young University, 1937; LL.B., St. John's University, 1939.

**Lawrence W. Sardoni** ..... Professor of Music (1945)
B.A., M.A., Brigham Young University, 1935, 1946

***Sterling D. Sessions** ..... Associate Professor of Business Management (1961)
B.A., Brigham Young University, 1949; M.A., New York University, 1950; DBA, Harvard, 1962.

**Donald D. Shaw** ..... Associate Professor of Health Education (1959)
B.A., M.S., Brigham Young University, 1957, 1961; Ed.D., Oregon State University, 1965.

**R. Phil Shumway** ..... Professor of Animal Science (1949)
B.S., Utah State University, 1947; M.S., University of Minnesota, 1949; Ph.D., Utah State University, 1959.

**Wayne Shute** ..... Assistant Professor of Graduate Education; Coordinator of Community Education, Division of Continuing Education (1960)
B.S., M.Ed., Brigham Young University, 1955, 1959; Ed.D., University of Southern California, 1964.

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B.S.M.E., University of Utah, 1950; M.S.M.E., Ph.W., Purdue University, 1952, 1955.

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B.A., Pomona College, 1961; M.S., Ph.D., California Institute of Technology, 1964, 1965.

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B.S., M.S., Brigham Young University, 1944, 1957; C.P.A., Utah, 1957; Ph.D., Michigan State University, 1962.

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B.A., University of Oklahoma, 1935; M.A., Ph.D., Harvard University, 1948, 1950.

**Kay H. Smith** ..... Assistant Professor of Psychology (1961)
B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., Wayne State University, 1962.

**Oliver R. Smith** ..... Professor of Communications (1938)
B.A., Brigham Young University, 1938; Ph.D., State University of Iowa, 1951.

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B.S., Brigham Young University, 1943; M.A., University of Southern California, 1947; Ed.D., Brigham Young University, 1962.

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B.S., Brigham Young University, 1948; M.B.A., Northwestern University, 1949; C.P.A., Illinois, 1949; C.P.A., Utah, 1950; D.B.A., Indiana University, 1957.

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B.A., University of Utah, 1943; M.A., Brigham Young University, 1948; Ph.D., University of Washington, 1952.

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B.S., M.S., Ed.D., Brigham Young University, 1938, 1941, 1965; D.P.E., Indiana University, 1955.

**Irene Osmond Spears** ..... Professor of English (1936)
B.A., Brigham Young University, 1929; M.A., Ph.D., Stanford University, 1934, 1942.

**Walter H. Speidel** ..... Assistant Professor of German (1963)
Certificate of Maturity, Wilhelms-Oberschule, German, State Diploma, Interpreter Institute, Germany; M.A., University of Utah, 1960; Ph.D., University of Kansas, 1963.

**Sidney B. Sperry** ..... Professor of Old Testament Languages and Literature (1932)
B.A., University of Utah, 1917; M.A., Ph.D., University of Chicago, 1926, 1931.

**David V. Stimpson** ..... Assistant Professor of Psychology (1964)
B.S., M.S., Brigham Young University, 1959, 1960; Ph.D., University of California at Berkeley, 1964.

**Dayna L. Stocks** ..... Assistant Professor of Botany (1964)
B.S., Utah State University, 1956; M.S., University of Utah, 1960; Ph.D., Utah State University, 1964.

**Howard C. Stutz** ..... Professor of Botany (1953)
B.S., M.S., Brigham Young University, 1940, 1951; Ph.D., University of California at Berkeley, 1956.

**Floyd Sucher** ..... Assistant Professor of Teacher Education (1964)
B.S., Brigham Young University, 1954; M.A., Los Angeles State College, 1957; Ed.D., Colorado State College, 1963.

**Albert D. Swensen** ..... Professor of Chemistry (1947)
B.A., M.A., Brigham Young University, 1937, 1938; Ph.D., Louisiana State University, 1941.

**Russel B. Swensen** ..... Professor of History (1933)
B.A., Brigham Young University, 1926; M.A., Ph.D., University of Chicago, 1931, 1934.

**Joseph N. Symons** ..... Professor of Sociology (1953)
B.S., M.S., Utah State University, 1927, 1932; Ph.D., University of Chicago, 1944.

**Vasco M. Tanner** ..... Professor of Zoology and Entomology (1925)
B.A., Brigham Young University, 1915; M.A., University of Utah, 1920; Ph.D., Stanford University, 1925.

**Wilmer W. Tanner** ..... Professor of Zoology and Entomology (1949)
B.A., M.A., Brigham Young University, 1936, 1937; Ph.D., University of Kansas, 1949.

**Dale H. Taylor** ..... Associate Professor of Accounting (1963)
B.A., M.A., Brigham Young University, 1951, 1953; C.P.A., Illinois, 1955; Ph.D., Northwestern University, 1963.

**Weldon J. Taylor** ..... Professor of Marketing; Dean, College of Business (1937)
B.S., Brigham Young University, 1934; M.B.A., Harvard Graduate School of Business Administration, 1937; Ph.D., Graduate School of Business Administration, New York University, 1955.

**John A. Thomas** ..... Assistant Professor of English (1962)
B.A., M.A., Brigham Young University, 1953, 1954; Ph.D., University of Maryland, 1962.

**Woodruff C. Thomson** ..... Professor of English (1950)
B.A., M.A., Ph.D., University of Utah, 1938, 1949, 1962.

**Dennis W. Trent** ..... Assistant Professor of Bacteriology (1964)
B.S., M.S., Brigham Young University, 1959, 1960; Ph.D., University of Oklahoma School of Medicine, 1964.

**Jack B. Trunnell** ..... Professor of Developmental Biology; Director of Nutritional Research (1958)
B.A., Brigham Young University, 1942; M.D., University of Utah, 1945.

**Glen H. Turner** ..... Associate Professor of Art (1947)
B.S., M.A., Brigham Young University, 1940, 1948.

**Rodney Turner** ..... Associate Professor of Religious Education (1956)
B.A., M.A., Brigham Young University, 1949, 1953; Ed.D., University of Southern California, 1960.

**L. Elliott Tuttle** ..... Assistant Professor of Geography (1936)
B.S., M.S., Brigham Young University, 1938, 1948.

**S. Lyman Tyler** ..... Professor of History; Director of Libraries (1952)
B.S., Ph.D., University of Utah, 1949, 1951.

**Richard D. Ulrich** ..... Associate Professor of Mechanical Engineering (1960)
B.S., M.S.M.E., Ph.D., Purdue University, 1954, 1955, 1959.

**Lee B. Valentine** ..... Professor of Spanish (1939)
B.A., M.A., Brigham Young University, 1939, 1948; Ph.D., Stanford University, 1958.

**Howard B. Vanfleet** ..... Associate Professor of Physics (1960)
B.S., Brigham Young University, 1955; Ph.D., University of Utah, 1961.

**Rudger H. Walker** ..... Professor of Agronomy; Dean, College of Biological and Agricultural Sciences (1960)
B.S., Brigham Young University, 1923; M.S., Ph.D., Iowa State University, 1925, 1927.

**Max V. Wallentine** ..... Associate Professor of Animal Science (1962)
B.S., Utah State University, 1955; M.S., Ph.D., Cornell University, 1956, 1960.

**Ted J. Warner** ..... Assistant Professor of History (1962)
B.S., M.S., Brigham Young University, 1955, 1958; Ph.D., University of New Mexico, 1964.

**Max L. Waters** ..... Assistant Professor of Business Education (1958)
B.A., M.Ed., Brigham Young University, 1958, 1960; Ed.D., Colorado State College, 1963.

**Arthur R. Watkins** ..... Professor of German (1952)
B.A., M.A., Brigham Young University, 1941, 1942; Ph.D., Stanford University, 1948.

**Ray Watters** ..... Professor of Health and Physical Education (1957)
B.S., M.S., Utah State University, 1948, 1950; H.S.D., Indiana University, 1960.

**Stanley H. Watts** ..... Associate Professor of Physical Education; Head Basketball Coach (1947)
B.S., Brigham Young University, 1938.

**Max D. Weaver** ..... Associate Professor of Art (1961)
B.S., M.A., Utah State University, 1939, 1955.

**Stanley L. Welsh** ..... Associate Professor of Botany (1960)
B.S., M.S., Brigham Young University, 1951, 1957; Ph.D., Iowa State University, 1960.

**Dale H. West** ..... Professor of English (1947)
B.A., Brigham Young University, 1940; M.A., University of Southern California, 1955; Ed.D., University of Colorado, 1962.

**Fred G. White** ..... Associate Professor of Chemistry (1961)
B.S., M.S., Brigham Young University, 1952, 1956; Ph.D., University of California, 1961.

**Leslie Whitton** ..... Assistant Professor of Botany (1962)
B.S., Utah State University, 1949; M.S., University of California at Davis, 1953; Ph.D., Cornell University, 1964.

***Ray T. Wilcox** ..... Associate Professor of Secondary Education (1957)
B.S., M.Ed., Brigham Young University, 1951, 1954; Ed.D., University of California at Berkeley, 1957.

**Ernest J. Wilkins** ..... Professor of Spanish; Director, Language Training Mission (1953)
B.A., Brigham Young University, 1947; M.A., Ph.D., Stanford University, 1949, 1954.

**Ernest L. Wilkinson** ..... President of the University (1951)
B.A., Brigham Young University, 1921; LL.B., George Washington University, 1926; S.J.D., Harvard University, 1927; LL.D., Brigham Young University, 1957.

**Milton G. Wille** ..... Assistant Professor of Mechanical Engineering (1964)
B.A., B.E.S., Brigham Young University, 1957, 1957; M.S.M.E., California Institute of Technology, 1958; Ph.D., University of Michigan, 1964.

**Glenn R. Williams** ..... Associate Professor of Music (1965)
B.A., Brigham Young University, 1953; M.M., D.M.A., Eastman School of Music, 1954, 1961.

**Byron Joy Wilson** ..... Assistant Professor of Chemistry (1965)
B.S., Idaho State College, 1955; M.A., Southern Illinois University, 1958; Ph.D., University of Washington, 1961.

**Marguerite I. Wilson** ..... Associate Professor of Special Education (1956)
B.S., University of Utah, 1948; M.A., San Francisco State College, 1955; Ed.D., George Peabody College for Teacher, 1965.

**Warren B. Wilson** ..... Associate Professor of Art and Education (1954)
B.S., Utah State University, 1943; M.F.A., State University of Iowa, 1949.

**Richard B. Wirthlin** ..... Associate Professor of Economics (1961)
B.S., M.A., University of Utah, 1956, 1957; Ph.D., University of California, 1963.

**Glena D. Wood** ..... Associate Professor of English (1952)
B.A., Brigham Young University, 1936; M.A., Ph.D., University of Kentucky, 1949, 1958.

**Stephen L. Wood** ..... Associate Professor of Zoology and Entomology (1956)
B.S., M.S., Utah State University, 1946, 1948; Ph.D., University of Kansas, 1953.

**Lael J. Woodbury** ..... Professor of Dramatic Arts (1954)
B.S., Utah State University, 1952; M.A., Brigham Young University, 1953; Ph.D., University of Illinois, 1954.

**Richard C. Woodbury** ..... Assistant Professor of Electrical Engineering (1959)
B.S., University of Utah, 1956; M.S., Ph.D., Stanford University, 1958, 1965.

**Leon W. Woodfield** ..... Assistant Professor of Accounting (1960)
B.S., M.B.A., University of Utah, 1956, 1957; C.P.A., California, 1959, Utah, 1960; D.B.A., Michigan State University, 1965.

**Ralph Woodward** ..... Professor of Music (1955)
B.A. University of Idaho, 1937; M.M., Cincinnati Conservatory of Music, 1948; D.M.A., University of Illinois, 1964.

**Golden L. Woolf** ..... Professor Emeritus of Educational Administration (1934)
B.A., M.A., Brigham Young University, 1934, 1936; Ed.D., University of California, 1940.

**David H. Yarn, Jr.** ..... Professor of Philosophy (1950)
B.A., Brigham Young University, 1946; M.A., Ed.D., Columbia University, 1949, 1958.

**Paul H. Yearout** ..... Associate Professor of Mathematics (1962)
B.A., Reed College, 1949; M.S., Ph.D., University of Washington, 1958, 1961.

**Karl E. Young** ..... Professor of English (1930)
B.A., M.A., Oxford University (England), 1930, 1934.

On authorization by the Graduate Council the service of members of the Graduate Faculty will be supplemented by that of other members of the University faculty whose advanced training and effective academic work in highly specialized fields qualifies them for service in the graduate program.

*On leave.

# General Information

## History and Purpose

The first graduate offerings of Brigham Young University were established in 1918, forty-three years after the founding of Brigham Young Academy, and within an administrative unit designated as the Graduate Division. The objective of graduate study was then stated in these terms: "The essential aim . . . is to develop the power to do independent work and to encourage the spirit of research. Each candidate is expected to possess a broad general knowledge of his major subject with less detail in the case of his minor subjects."

Institutions of higher learning reflect the aspirations and major achievements of the American people. They carry the ideals, dreams, and hopes of democracy from generation to generation. From their ranks must come men and women trained in the skills, the arts, and the sciences, and dedicated to a high spiritual understanding through which men can work for the common good.

## Professional Associations

Brigham Young University Graduate School is a member of the following professional associations:

Council of Graduate Schools in the United States
Western Association of Graduate Schools

## Administration and Organization

**The Graduate Dean.** The dean of the Graduate School as general administrator of the graduate program of the University is responsible, under authorization of the academic vice-president and the President, to execute policy and procedure of the Graduate School. He serves as chairman of the Graduate Council and conducts meetings of the graduate faculty.

**The Graduate Council.** The chief administrative body for the graduate program is the Graduate Council, which includes the dean of the Graduate School as chairman, the director of research, four members of the graduate faculty elected at large for terms of three years, and one member of the graduate faculty elected for a three-year term from each of the areas of subject matter included in the undergraduate colleges. The academic vice-president and the director of libraries are ex officio members of the council. The Graduate Council is empowered to act for the graduate faculty on all student petitions and on departmental requests for approval of faculty members for temporary assignments to graduate instruction and supervision. The Council initiates proposals for policy and procedure regarding the graduate program.

**The Graduate Faculty.** It is the responsibility of the graduate faculty to formulate and recommend requirements for all types of graduate degrees and to recommend regulations and facilities to promote the scholarly activities and research interests of graduate students.

**Graduate Degrees**

The Graduate School offers programs leading to graduate degrees in areas designated by the terms "pure knowledge" and "applied knowledge." Degrees awarded in the pure knowledge area include Master of Arts, Master of Science, and Doctor of Philosophy. In these disciplines, the program emphasizes primarily a scholarly approach to theoretical and creative subject matter leading to the extension of human knowledge. Within these areas of study a thesis is among the

requirements for the master's degree. This requirement can be waived only under most exceptional circumstances. An acceptable dissertation and foreign language proficiency are among the requirements for the Ph.D. degree.

Degrees in applied knowledge emphasize principally the utilization of man's intellectual and cultural heritage for the benefit of mankind. Attention is given primarily to the pursuit of knowledge for its application in professional work with appropriate scholastic study and research toward this end. Included in this discipline are such degrees as Master of Accountancy, Master of Business Administration, Master of Education, Master of Fine Arts, Master of Health Education, Master of Library Science, Master of Music, Master of Recreation Education, Master of Religious Education, and Doctor of Education. With the approval of the Graduate Council and the University administration, each department chooses its respective program leading to the various degrees. Each department shall designate whether or not the master's degree program will require foreign language proficiency.

The Graduate School offers the master's degree in 81 fields distributed through 41 graduate departments and the doctor's degree in 31 fields distributed through 14 graduate departments. A department may be responsible for the operation of the graduate program in several fields. On the other hand, one field may include the offerings of several departments. The departments fall within the areas of biological and agricultural sciences, business, education, family living, fine arts and communications, humanities, physical and engineering sciences, physical education, religious instruction, social sciences, and industrial and technical education.

Graduate degrees are offered in the following departments and fields:

**Doctor of Philosophy**

Bacteriology

Botany

Chemistry
- Analytical-Physical Chemistry
- Biochemistry
- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry

Child Development and Family Relationships
- Child Development
- Family Relationships
- Marriage Counseling

Geology
- Economic Geology
- Mineralogy and Petrology
- Paleontology
- Stratigraphy and Sedimentation
- Structural, Field, and Dynamic Geology

Graduate Department of Education
- Educational Psychology

Graduate Studies in Religious Instruction
- Bible and Modern Scripture
- History of Religion

History

Languages
- French
- German
- Spanish

Music

Physics

Psychology
- Clinical Psychology
- General Psychology
- Social Psychology

Sociology and Anthropology

Zoology and Entomology

**Doctor of Education**

Graduate Department of Education
- Curriculum and Instruction
- Educational Administration
- Educational Psychology

**Doctor of Religious Education**

Graduate Studies in Religious Instruction
- Religious Education

**Master of Arts**

Archaeology

Art
- Painting and Sculpture
- Design and Crafts

Communications

Dramatic Arts
- Interpretation
- Theatre and Dramatic Arts

English
- American Literature
- English Literature

Graduate Department of Education
- Counseling and Guidance
- Educational Administration
- Educational Psychology
- Elementary Education
- Higher Education
- School Psychology (interdepartmental)
- Secondary Education
- Special Education

Graduate Studies in Religious Instruction
- Bible and Modern Scripture
- History of Religion

History

Institute of Government Service
- International Affairs

Languages
- French
- German
- Latin
- Portuguese
- Spanish

Music
- Music Education
- Music Theory
- Musicology

Physical Education

Political Science
- American Government and Politics
- Foreign Government and Politics
- International Relations
- Political Theory
- Public Administration
- Public Law

Recreation Education

Speech
- Public Address

**Master of Science**

Agronomy

Animal Science

Bacteriology

Botany

Business Education and Office Management

Chemical Engineering Science

Chemistry
- Analytical-Physical Chemistry
- Biochemistry
- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry

Child Development and Family Relationships
- Child Development
- Family Relationships

Civil Engineering Science

Economics

Electrical Engineering Science

Food and Nutrition

Geography

Geology
- Economic Geology
- Mineralogy and Petrology
- Paleontology
- Stratigraphy and Sedimentation
- Structural, Field, and Dynamic Geology

Health and Safety Education

Industrial Education

Institute of Government Service
- State and Local Government
- National Government

Mathematics

Mechanical Engineering Science

Physical Education

Physics

Psychology
- General Psychology
- School Psychology (interdepartmental)

Sociology and Anthropology

Speech
- Speech Pathology and Audiology

Statistics

Zoology and Entomology

**Master of Accountancy**

Accounting

**Master of Business Administration**

Business Management

**Master of Education**

Graduate Department of Education
- Counseling and Guidance
- Educational Administration
- Educational Psychology
- Elementary Education
- Higher Education
- School Psychology
- Secondary Education
- Special Education

**Master of Fine Arts**

Art

**Master of Health Education**

Health and Safety Education

**Master of Library Science**

Graduate Department of Library Science

**Master of Music**

Music
- Organ
- Piano
- Voice

**Master of Recreation Education**

Recreation Education

**Master of Religious Education**

Graduate Studies in Religious Instruction
- Religious Education

Minors are offered in the fields listed above in addition to the following fields:

Agricultural Economics
Applied Music
Basic Chemistry
Business Management
Educational Philosophy and Programs
Philosophy

# General Requirements

## ADMISSION TO THE GRADUATE SCHOOL

Admission to the Graduate School is contingent upon completion of the bachelor's degree. The University does not offer a second bachelor's degree, therefore all eligible students holding the bachelor's degree will register in the Graduate School.

**Requirements for Admission on a Degree-Seeking Basis.** For admission as a degree-seeking graduate student an applicant must present a 3.0 (B) grade-point average during his latest 60 semester hours of academic work or during a period approved by the department and the dean of the Graduate School. The applicant may through qualifying examinations be required to furnish additional evidence concerning his ability to pursue graduate work in his major field. This may include capacity for research or creativity, facility in written and oral expression, or appropriate professional objectives. Other requirements may be prescribed.

A student whose native language is not English is cautioned that adequate command of the English language is indispensable to successful graduate work. He must include with his application for admission a statement from a responsible official indicating that the applicant knows how to read, write, speak and understand the English language sufficiently well to be able to pursue a satisfactory program of study on the graduate level. Admission of students from foreign countries ordinarily will be granted on a provisional basis pending the applicant's experience on the campus and his opportunity to demonstrate ability to do successful graduate work.

**Procedure for Admission on a Degree-Seeking Basis.** To be admitted to the Graduate School on a degree-seeking basis, a student should file with the Office of the Graduate Dean an application which includes the following: (1) forms for admission or readmission to the Graduate School. (Registration packets will be prepared for all students who were enrolled in day school for either of the two previous Summer School terms or during the preceding semester.); (2) two transcripts of all previous college work (if that work was **not** done at Brigham Young University); and (3) three letters of recommendation. Two of these letters should relate to the student's academic ability and the third to his character. These letters should be sent directly to the Office of the Graduate Dean by those making the recommendations. Forms for application and for letters of recommendation are provided by the Office of the Graduate Dean.

Application forms should be filed not later than two months before the beginning of the semester in which the student plans to begin his work. Students who do not have their applications filed by this date cannot be assured that their applications will be acted upon by registration time.

The forms are evaluated by the department in which the student intends to major and by the dean of the Graduate School. Permission to register as an unclassified student should not be confused with permission to register as a degree-seeking graduate student. Admission to either classification is initiated by the student and authorized by the dean of the Graduate School. Notice of acceptance as a degree-seeking student is sent to the applicant from the Office of the Graduate Dean.

**Provisional Degree-Seeking Students.** The student whose latest two years of academic record is between 2.5 and 3.0 (B) or who matriculated from a university which is not accredited may be admitted on a provisional classification upon recommendation of his department chairman and the approval of the graduate dean. A student classified as provisional, due to grade-point average, shall be required to submit a minimum of 12 semester hours of graduate or approved upper-division credit with a "B" average or higher before being reconsidered for full degree-seeking status. Graduate or approved upper-division credit in an amount of 16 hours received while on provisional status may, if acceptable to the department, be counted toward a graduate degree. For special and significant reason an advisory committee may recommend that graduate or approved upper-division credit beyond 16 hours and not in excess of 21 hours earned during pro-

visional status be granted toward the degree. Final decision on such a request is the responsibility of the graduate dean.

**Admission on a Nondegree Basis.** A student with the bachelor's degree may register on a nondegree basis for a wide variety of courses for which he is prepared. Credit earned during nondegree classification will count toward a graduate degree only in a highly limited amount and then as recommended by the faculty advisory committee after the student has been admitted on a degree-seeking basis. No such credit can be used that carries a grade lower than a "B". To be admitted to the Graduate School on a nondegree basis, a student should file with the Office of the Graduate Dean (unless he was in attendance the preceding semester) an application for admission or readmission, furnish an official transcript of all college or university work other than that completed at Brigham Young University, show evidence of having received the bachelor's degree, and present an academic record of 2.0 or higher. Admission is by means of a registration permit issued by the Office of the Graduate Dean. If a student was enrolled in day school at Brigham Young University during either of the two previous Summer School terms or during the previous semester, registration materials are automatically prepared for him.

### SCHOLASTIC STANDARDS

A grade-point average of 3.0 for all credit applying toward the degree is required of any student earning a degree in the Graduate School. A degree-seeking student whose cumulative grade-point average, while registered in the Graduate School, falls below 2.7 shall have his academic record reviewed by the department chairman and the graduate dean to determine whether or not he shall remain on degree-seeking status. Graduate students whose grade-point averages fall below 2.5 cumulative in credit applying toward the degree will be placed on immediate academic probation for one semester with opportunity to raise the grade-point average to 2.7 or higher. A student with a cumulative grade-point average under 2.0 is not eligible for registration in the Graduate School under any classification.

## Master's Degree

### PROCEDURE FOR THE GRADUATE DEGREE-SEEKING STUDENT

Following admission to the Graduate School on a full or provisional degree-seeking basis, the student is responsible for proper clearance of the following forms and their due dates as designated:

**English 99.** The English 99 form is due during the first semester of graduate work. Students who are required to register in English 99, Problems in Thesis Writing, a noncredit course, should take this course at the earliest possible time.

**Advisory Committee.** The advisory committee must be formed and the names of the members on file in the Office of the Graduate Dean prior to the student's registration for the last 15 semester hours of credit applying toward the degree.

The student's program and his thesis are developed under the direction and supervision of the advisory committee. The committee for the master's degree consists of two or more members. In a program offering a minor field, one member of the committee is to be selected from the minor field. These members are nominated by the student from the graduate faculty of his major and minor or supporting fields, in consultation with the chairman of his major department and with the approval of the dean of the Graduate School. The chairman of the advisory committee is a representative of the major field. This committee advises the student in his proposed program, approves the official course outline, advises him in registration, and directs his research and the work on his thesis. The advisory committee should be selected before the close of the first semester of registration, and the names of the committee members on file in the Office of the Graduate Dean. All credit that is to apply toward an advanced degree must be approved by the advisory committee.

An advisory committee may be changed with the approval of all prospective members of the newly constituted committee, the chairman of the major department, and the dean of the Graduate School. After such a change, the student reviews his entire program with the new committee.

**Course Outline.** This constitutes the official program of the graduate student and is due in the Office of the Graduate Dean not later than one week following the appointment of the advisory committee and in all cases prior to registering for the last fifteen hours of credit applying toward the degree.

**Revisions.** When there is a needed change in the student's course outline, advisory committee membership, etc., a memo should be submitted by the student to the Office of the Graduate Dean recommending the revision and signed by members of the new advisory committee and the department chairman.

**Title Card and Prospectus of the Master's Thesis.** Before beginning his research or creative work, the student must obtain approval of the thesis problem. He must file with the Office of the Graduate Dean a title card and a prospectus, both signed by the members of the advisory committee and the department chairman. This should be done prior to registering for the last semester of credit applying toward the degree.

**Application for Graduation.** A student, who contemplates graduation, should secure from the Office of the Graduate Dean an Application for Graduation form and pay the graduation fee of $20 at the Treasurer's Office. This should be done not later than January 15 for June graduates and March 15 for August graduates, and before submitting the thesis to the Office of the Graduate Dean for approval as a basis for scheduling the final examination. A $3 late fee will be charged following the above dates.

## SUBMITTING THESIS OR PROJECT FOR APPROVAL AND BINDING

The thesis or project (including an abstract not exceeding in length 60 lines of 60 spaces each) approved by members of the advisory committee and the department chairman, must be submitted for approval to the Office of the Graduate Dean two weeks prior to scheduling the final oral examination. Upon approval of the thesis or project by the dissertation secretary in the Office of the Graduate Dean, the orals may be scheduled and copies of the thesis or project are to be distributed to members of the oral examination committee for review before the oral is given. Following the examination, the final copies of the thesis or project, plus one extra original copy of the abstract, (two if the student is majoring or minoring in education) signed by members of the advisory committee and the department chairman, are to be submitted to the Office of the Graduate Dean for final approval and authorization to submit to the library for binding. Graduation will occur only in the case of students who submit to the Office of the Graduate Dean the thesis binding receipt not later than 15 days before graduation.

Detailed directions for the form of the thesis are obtained from the major department. A department may authorize a minimum of 6 and a maximum of 9 credit hours for a master's thesis. The thesis credit shall include such disciplines as review of the literature, all thesis research, and the writing of the thesis.

**Time Limit.** Graduate credits are applicable toward the master's degree within a six-year period from the time they are received. Students are counseled to complete their programs without notable interruption.

Under the following conditions academic work taken beyond the regularly specified time limit may be accepted toward a graduate degree: The department making a request for an exception to the time-limit rule will make its proposal to the graduate dean with reference to each student case and on authorization will administer a special examination on the course work in question. The graduate dean shall be fully informed regarding the specific examination, including the date on which it is to be administered and the results. The student will be permitted to count toward a graduate degree, courses successfully cleared through such examinations.

## AMOUNT AND DISTRIBUTION OF CREDIT

The master's degree requires a minimum of 30 semester hours of credit. Of these 30 hours, 21 shall be earned in courses for which there is a systematic body of subject matter. Registration for individual reading, literature review, thesis research or special problems may not be included in this total of 21 credit hours.

A department, after authorization by the Graduate Council, may function under either of the following options:

**Option I.** At least 15 semester hours, exclusive of thesis, must be in the major field and at least 9 semester hours in a minor field approved by the major department.

**Option II.** Thirty hours must be in the major field or in direct support of the major field. Courses outside the major field and considered as in direct support of the major field must be specified. Under this option not more than 12 of the 30 semester hours shall be in supporting fields with at least 12 semester hours of course work in the major field of course work. A department will be permitted to adopt Option II on request of the department and approval of the Graduate Council. The department need not list courses which are considered to be in direct support of the major field, but when Option II is used the student's committee should consist of two members, one of which may be from a supporting area.

A graduate student may have applied toward requirements for the master's degree a limited amount of credit earned by taking certain upper-division undergraduate courses which have been approved by the graduate advisory committee at the time of registration or appearing on the course outline of a degree-seeking student. At least 20 hours of the credit for the master's degree must be in the 500 series or above and taken on the Brigham Young University campus. Course 699 may be part of these 20 hours.

A minimum grade-point average of 3.0 is required in all work applying toward the degree.

Neither lower division nor correspondence credit can be applied toward a graduate degree.

**Graduate Credit for Seniors.** If, during the last semester of the senior year, a candidate for a baccalaureate degree finds it possible to complete all requirements for such a degree with a registration of fewer than sixteen hours of undergraduate credit, he may register for graduate credit to the extent that the total registration shall not exceed sixteen hours during the semester. A form provided by the Office of the Graduate Dean stating that all baccalaureate requirements are being met during the current semester must be signed by the appropriate undergraduate dean and presented to the dean of the Graduate School at the time of such registration. This registration does not constitute permission to seek a higher degree, and such credit does not apply toward a higher degree unless it is later approved by the student's graduate advisory committee.

**Transfer Credit.** Graduate credit acceptable to a student's advisory committee and not in excess of 10 semester hours may be transferred from another accredited university of the United States upon the approval of the student's advisory committee and the Graduate Council. Forms for petitioning for such transfers are available in the Office of the Graduate Dean. Credit transferred must represent graduate work which is a fair and reasonable equivalent of corresponding work at this University. All transferred credit must be of grade "B" or better. At least twenty semester hours toward the master's degree must be taken on the Brigham Young University campus.

## STUDENT LOAD

An academic load for graduate students not employed part time is from 9 to 16 semester hours or their equivalent. Teaching assistants and others employed part time should limit their loads to fewer than 14 credit hours. Graduate teaching assistants are expected to carry a minimum of 6 hours of credit approved by the registration advisor and the dean of the Graduate School. Full-time employees should register for not more than 5 semester hours. Due to the depth

required in graduate study, students usually should take less than the maximum load permitted.

**GRADUATION**

All graduating students must attend the graduation exercises unless they have made satisfactory explanations of absence and have been officially excused under the authority of the President of the University. The request to be excused from the commencement exercises must be presented in writing to William R. Siddoway, Dean of Admissions and Records, at least two weeks prior to commencement. Extreme emergencies of either illness or death in the family are the only exceptions to this requirement. Students not officially excused from the commencement will not be graduated until they attend a later commencement.

**FINAL ORAL EXAMINATION**

The candidate for graduation must pass a final oral examination not less than 20 days prior to graduation.

This examination cannot be scheduled until the student has submitted approved copies of his thesis or project to the Office of the Graduate Dean and secured the forms for scheduling the examination. On these forms the student will have listed by his department chairman the names of all members of the examining committee. Following the examination, the final signed copies of the thesis or project are to be submitted to the Office of the Graduate Dean for final approval and authorization to submit to the library for binding, not later than 15 days before graduation.

The examination committee for the master's degree will consist normally of at least four members. There must be at least two examiners from the student's major field and one examiner from the student's minor or supporting field. There shall be on the committee at least two examiners who are not members of the student's thesis advisory committee. The committee may consist of a minimum of three examiners if constituted as provided above. In any case, two or more negative votes will constitute failure in the examination. Other members of the graduate faculty may attend the examination and enter the discussion as nonvoting participants.

The final oral examination consists of a student's defense of his thesis and a searching examination into the student's preparation and competence in his major and minor or supporting fields.

## Sixth-Year Certificate - Specialist in Education

The Graduate Department of Education offers a sixth-year program in each of the following areas: educational administration, curriculum and instruction, counseling and guidance, special education, and reading.

## Doctor's Degrees

The Graduate School offers the following doctor's degrees: Doctor of Philosophy, Doctor of Education, and Doctor of Religious Education. The doctor's degree is awarded upon completion of general and departmental requirements. For specific requirements see the departmental listings.

## Doctor of Education Degree

**ADMISSION REQUIREMENTS**

For admission to degree-seeking status as a doctoral applicant, the student must have completed 22 semester hours of education or possess certification as a teacher, must have completed two years of successful professional experience, possess demonstrable acquaintance with the field of education and be admitted by the Graduate School. The student will be tested for familiarity with background factors of significance to education.

## CLASSIFICATION OF DOCTORAL STUDENTS

Students seeking the Doctor of Education degree are classified as **doctoral applicants** and **doctoral candidates**. The student must be admitted to degree-seeking status as a **doctoral applicant** at Brigham Young University during the first semester he is enrolled as a full-time graduate student. He is **admitted to candidacy** after meeting conditions for admission to candidacy and before registering for the field project and internship.

## ADVISORY COMMITTEE

The early advisement of the student, until he passes the entrance examination, is supervised by the graduate committee in education which assigns him a specific adviser in his major field.

When the student successfully passes the entrance requirements, he is notified to consult with his department chairman to arrange for his advisory committee. The chairman and one member of the advisory committee must be in the student's major field, and there must be at least two additional members representing two other fields. The chairman of the major department is a member ex officio. All work which is to apply toward the Doctor of Education degree must be approved by the advisory committee.

As soon as his program of study is determined in consultation with the advisory committee, the student should supply each member of the committee with a copy of the course outline. He should file one copy, signed by the committee members, with the Office of the Graduate Dean and one copy with the graduate office of the College of Education.

The membership of the advisory committee may be changed with the approval of the graduate committee in education and the dean of the Graduate School.

## ACADEMIC REQUIREMENTS

The Ed.D. degree is awarded for distinguished attainment in a recognized field of learning. The student must meet the planned program as established by his major department. The equivalent of a minimum of three years of full-time study beyond the bachelor's degree is required. Full-time study is defined as nine to sixteen hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements and may accept or require up to two years of full-time study elsewhere. One year must consist of two consecutive semesters on the campus of the University, during which the student takes a minimum of one two-hour seminar each semester. There is no foreign language requirement. The student must demonstrate proficiency in statistics to the satisfaction of the advisory committee.

## ADMISSION TO CANDIDACY

To be eligible for advancement to candidacy, the student must pass the qualifying examination, final written examination, and submit a field project title card and prospectus approved by his doctoral advisory committee. Notice from the dean of the Graduate School then admits the student to candidacy for the degree.

## FIELD PROJECT AND REPORT

A research project for the improvement of an education program must be carried out under the direction of the student's advisory committee after he has passed the final written examination. The report of the field study must meet the same standards of format as the Doctor of Philosophy dissertation and must be submitted under the same schedule and requirements regarding publication.

## EXAMINATIONS

A qualifying examination is administered to all doctoral students after approximately fifty semester hours have been completed. A final written examination is administered to all doctoral students at the completion of their course work.

A final oral examination on the field project is administered at the conclusion of the field project and not later than 20 days before graduation. This examination cannot be scheduled until the student has submitted approved copies of his project

to the Office of the Graduate Dean and secured the forms for scheduling the examination. On these forms the student will have listed by his chairman the names of all members of the examining committee. The examining committee consists of the student's advisory committee and such other as the department chairman and dean of the Graduate School may designate.

### TIME LIMIT

All academic credit applying toward the Doctor of Education degree, exclusive of that earned in completion of the master's degree, must be completed within a period not to exceed nine years.

Under the following conditions academic work taken beyond the regularly-specified time limit may be accepted toward a graduate degree: The department making a request for an exception to the time-limit rule will make its proposal to the graduate dean with reference to each student case and on authorization will administer a special examination on the course work in question. The graduate dean shall be fully informed regarding the specific examination, including the date on which it is to be administered and the results. The student will be permitted to count toward a graduate degree, courses successfully cleared through such examinations.

## Doctor of Philosophy Degree

### CLASSIFICATION OF DOCTORAL STUDENTS

Students admitted to the Doctor of Philosophy degree program are classified as **doctoral applicants** and **doctoral candidates.** The student must be admitted to degree-seeking status as a **doctoral applicant** at Brigham Young University not later than the beginning of his last three semesters of full-time study intended to apply on the degree. The student is **admitted to candidacy** after meeting conditions for admission to candidacy and before registering for the last two semesters of full-time study intended to apply on the degree.

### ADVISORY COMMITTEE

The student's program and his dissertation are developed under the direction and supervision of an advisory committee. The committee for a student working for the Doctor of Philosophy degree consists of at least three members. These members are nominated by the student from the graduate faculty of his major and minor or supporting fields in consultation with the chairman of his major department and with the approval of the dean of the Graduate School. The chairman of the advisory committee is a representative of the major field. All work which is to apply toward the Doctor of Philosophy degree must be approved by the advisory committee.

As soon as his program of study is determined in consultation with the advisory committee, the student should supply each member of the committee with a copy of the course outline, and he should file with the Office of the Graduate Dean a properly signed copy. Forms for this filing are available in the Office of the Graduate Dean.

The membership of the advisory committee may be changed with the approval of all prospective members of the newly constituted committee, the chairman of the major department, and the dean of the Graduate School. After such a change the student reviews his entire program with the new committee.

### ACADEMIC REQUIREMENTS

The Doctor of Philosophy degree is awarded for distinguished attainment in a recognized field of learning, not merely for the completion of courses of study. The student must select a major field of study and at least one minor or supporting field approved by the department chairman and the dean of the Graduate School. A specified minimum amount of course work in each field is required beyond the bachelor's degree.

A full semester of residence credit is defined as from nine to sixteen hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements

and may accept or require a maximum of two years of full-time study at another university. Ordinarily two years of full-time course work or research or its equivalent is to be taken on the Brigham Young University campus. At least two consecutive semesters of work, during each of which a student is registered for not less than 9 semester hours, must be taken on the Provo campus.

**LANGUAGE REQUIREMENT**

Before completing his comprehensive examinations and being admitted to candidacy, the student must present satisfactory evidence of completing the foreign language requirement. This may be accomplished under either of the following options.

**Option I.** Two-language requirement for the Ph.D. degree with any one or a combination of the following provisions for meeting it:

A. Successful completion of the ETS examination in French and German, or in Russian when this language has been authorized by the Graduate Council as a replacement for the French or German requirement. (These are the only language tests presently offered by ETS.)

B. Successful completion of Language courses 95 and 96 in either or both acceptable languages.

C. Successful completion of sixteen semester hours of credit in either or both of the foreign languages approved by the department and the Graduate Council for the degree program.

If the student chooses as his second language one other than French, German or Russian, he must pass a special examination prepared by the Language Department and administered by B.Y.U. Testing Division, which includes minimum oral facility in one language. Examinations for these languages will be given only during specified dates in late October, February, April, and July. The student must file an application with the Office of the Graduate Dean, at least two weeks prior to the week of the examination. These examinations may be taken the first time without the payment of any fee or special permission. Subsequent attempts must be by written permission of the chairman of the academic department and payment of a $10 fee.

Dates of and application for the ETS language examinations in French, German, and Russian can be secured from Testing Division, B-238 ASB.

**Option II.** Single-language requirement for the Ph.D. degree:

The foreign language requirement for the doctoral degree may be met through intensive study of one language leading to thorough familiarity with it. The objective of this requirement is to produce a scholar who can read the literature in an acceptable foreign language with fluency; one who can also converse with colleagues in his field in that particular language. Fulfillment of this objective would be manifest by examination that would demonstrate (1) the candidate's ability to translate literature in the field of specialization without the use of a dictionary with a competent level of speed and accuracy, and (2) his ability to converse in the language with acceptable facility.

In lieu of an examination, this requirement can be met by completion of courses 321, 415, and 416 and their prerequisites with a grade of "B" or better in the language chosen. Ordinarily, completion of this requirement will require 25 semester hours as follows: 101, 102, 201, 301, 321, 415, 416. Students familiar with the language may be able to earn the first 16 hours credit by special examination, thereby qualifying them to register directly in courses 321, 415 and 416.

This requirement may be fulfilled in French or German and in Russian when that language has been approved by the department and the Graduate Council.

**LANGUAGE EXAMINATION**

The date on which tests will be given will be announced each semester.

An examination for a given language other than French, German, or Russian may be taken the first time without the payment of any fee or special permission.

Approval for the second trial must be by written permission of the chairman of the academic department ond payment of a $10 fee. Any subsequent attempt must satisfy the same requirement as the second examination and in addition required the permission of the graduate dean.

Dates of the ETS language examinations in French, German, and Russian can be secured from Testing Division, B-238 ASB.

## COMPREHENSIVE EXAMINATION

The student must pass a comprehensive examination in his doctoral fields under the direction of his major department. In this examination the minor department will be represented by the present minor member of the advisory committee representing that department. This examination will normally be given at the end of the second year of graduate study.

## ADMISSION TO CANDIDACY

Satisfactory completion of the comprehensive examination, the language requirement and submission of a dissertation title card and prospectus approved by an advisory committee, is necessary for admission to candidacy for the Doctor of Philosophy degree.

Notice by the dean of the Graduate School then admits the student to candidacy for the degree. At least two semesters of full time study must be completed after admission to candidacy and before graduation.

## SUBMITTING DISSERTATION

After being admitted to candidacy, the student under the direction of his advisory committee, pursues original research toward an acceptable dissertation.

The dissertation (including an abstract not exceeding in length 60 lines of 60 spaces each) approved by members of the advisory committee and the department chairman, must be submitted for approval to the Office of the Graduate Dean two weeks prior to scheduling the final oral examination.

Upon approval of the dissertation by the dissertation secretary in the Office of the Graduate Dean, the orals may be scheduled and copies of the dissertation are to be distributed to members of the oral examination committee for review before the oral is given. Following the examination, the final copies of the dissertation, plus one extra original copy of the abstract (two if the student is majoring or minoring in education) signed by members of the advisory committee and the department chairman, are to be submitted to the Office of the Graduate Dean for final approval.

After the dissertation has been accepted by the Office of the Graduate Dean, the student will deliver 4 or more copies to Room 112 JRCL and pay the $25 fee for publishing the dissertation through University Microfilm Incorporated. The library will also collect $2.75 for each copy of the dissertation to be bound or a minimum of $11. The student will secure further instructions regarding binding, microfilming, and publication of dissertatons in the Office of the Graduate Dean.

## FINAL ORAL EXAMINATION

Not later than 20 days before graduation, the student must pass a final examination on his dissertation and applicable subject matter given by a committee of not fewer than five members. This examination cannot be scheduled until the student has submitted approved copies of his dissertation to the Office of the Graduate Dean and secured the forms for scheduling the examination. On these forms the student will have listed by his chairman the names of all members of the examining committee. The committee consists of the advisory committee, plus such other members as the department chairman and the dean of the Graduate School may designate. Following the examination, the final signed copies of the dissertation are to be submitted to the Office of the Graduate Dean for final approval and authorization to submit to the library for binding and microfilming. Graduation will occur only for students who submit to the Office of the Graduate Dean the dissertation binding and microfilming receipt not later than 15 days before graduation.

**TIME LIMIT**

All academic credit applying toward the Doctor of Philosophy degree, exclusive of that earned in completion of the master's degree, must be completed within a period not to exceed nine years.

Under the following conditions academic work taken beyond the regularly-specified time limit may be accepted toward a graduate degree: The department making a request for an exception to the time-limit rule will make its proposal to the graduate dean with reference to each student case and on authorization will administer a special examination on the course work in question. The graduate dean shall be fully informed regarding the specific examination, including the date on which it is to be administered and the results. The student will be permitted to count courses successfully cleared through such examinations toward a graduate degree.

## Scholarships, Fellowships, and Assistantships

Graduate awards are administered through the Committee on Graduate Awards which functions under the chairmanship of the dean of the Graduate School.

**Brigham Young University Fellowships and Scholarships.** The University has established the following fellowship and scholarship program for graduate students:

60 scholarships for the payment of tuition and standard fees

50 fellowships ranging in value from $400 to $2,000 including tuition and standard fees

Scholarships and fellowships are awarded on the basis of high academic achievement and are available to students in all areas of graduate study. Recipients must possess a baccalaureate degree at the beginning of the period for which the scholarship or fellowship is granted and must be candidates for a higher degree. Students who hold scholarships may accept one-half time assistantships when these are available in the department. Students who hold fellowships are limited to one-fourth time assistantships. Applications for graduate awards for the academic year beginning in September should be filed by the preceding March 1.

**National Aeronautics and Space Administration.** The University cooperates with the NASA for special three-year student awards in scientific fields. The application deadline date is March 1.

**National Defense Education Act, Title IV.** Announcements concerning the Title IV three-year awards are usually released in late October with a deadline date of March 1.

**National Science Foundation.** The University cooperates with the National Science Foundation, and fellowships under this program are available in several fields. Application deadline dates range from early December to March 1.

**Application.** Information regarding scholarships and fellowships may be obtained from the Graduate Scholarship and Awards Office, D-227 ASB.

**Teaching and Laboratory Assistantships.** Many departments employ graduate students as teaching or laboratory assistants. Assistantships are awarded on the basis of scholastic accomplishment and competence to serve in a specific department. Remuneration, based on the amount of time devoted to assigned duties, varies from $850 to $2,000 per academic year. For application forms and information regarding teaching assistantships, the graduate student should write directly to the chairman of his specific academic department in the University.

**Research Assistantships.** A substantial number of research assistantships and research fellowships are available at Brigham Young University. Recipients work part time on research projects under the supervision of a faculty member.

Funds are provided by the University, the government, or private sources. Remuneration for assistantships varies from $1,600 to $2,800 per calendar year. For application forms and information regarding research assistantships, the student should write directly to the chairman of his specific academic department in the University.

**Agreement with the Council of Graduate Schools in the United States.** Brigham Young University, as a member of the Council of Graduate Schools in the United States, cooperates with other members of that Council in requiring that a student who has accepted an award or an assistantship in any graduate school before April 15 of each year and who desires a change of plans to attend another graduate school, can receive an award from the second school only after an official release from the first.

## Student Loans and Financial Aids

Limited funds are available to help students remain in school when financial emergencies have arisen and personal or family resources are not available.

**Short-term Loans.** Short-term loans are available for emergency assistance for tuition, books, fees, and other school expenses to full-time day students. These loans are made in small amounts for immediate requirements. Repayment usually is required within the current semester.

**Church Student Loan Fund.** The Church of Jesus Christ of Latter-day Saints makes aid available through a long-term loan program by which loans may be made to worthy full-time L.D.S. students who are in critical financial need for tuition, books, fees, and other school expenses. Loans may be made each year in amounts not in excess of $500 for graduate students. The maximum cumulative loan to any student cannot exceed $2,100. The student may be permitted to delay making repayment until after he discontinues his full-time status at B.Y.U.

**Application.** Information regarding financial aids and application forms is available in the Financial Aids Office, D-151, ASB.

## Summer Session

Graduate students doing part of their work at the University during the summer will find a wide range of graduate courses suited to their purpose. Summer School is divided into two terms. Students may register for a maximum of six credit hours per term.

## University Library

The J. Reuben Clark, Jr., Library contains the library collection, which includes approximately 550,000 bound volumes, several thousand pamphlets, and an extensive collection of titles on microfilm and microcards. A good selection of professional journals and other current periodicals as well as local, regional, and national newspapers is also available.

The library is a depository for United States and Canadian government documents and regularly receives publications of state and local governments. The general library facilities are available to students, faculty, alumni, and other interested persons. Regularly enrolled students present their activity cards to borrow books. Others may obtain a permit from the circulation librarian. The library is open during the college year from 7:00 a.m. to 10:00 p.m. Monday through Thursday, from 7:00 a.m. to 9:00 p.m. Fridays, and from 9:00 a.m. to 8:00 p.m. Saturdays. Vacation hours, when school is not in session, are 8:00 a.m. to 5:00 p.m. Monday through Friday; it is closed weekends and holidays.

The general collection is available on open shelves on four of the five levels—two below and two above the ground floor. The central reference collection, the public catalog, the circulation desk, and administrative offices are located on the ground level. An informational booklet is available to assist in the

use of these facilities. Study space is available on each floor interspersed with stack areas.

The special collections of the library, located on the fourth level, often come to the library from individuals whose interests lead them to devote many years to their acquisition. The books and other material housed in this area are not available for general circulation. Material within each collection is usually confined to a specific subject area.

The facilities of other libraries operated by the L.D.S. Church are available also to students of Brigham Young University. The Genealogical Society Library in Salt Lake City contains over 70,000 books and a half-million rolls of microfilm. These include family histories, genealogy, biography and autobiography, military records, cemetery inscriptions, town, county, and state histories of the United States, and both local and national histories of other nations.

Facilities of the library of the Church Historian's Office are available by arrangement to advanced students for research. It is located in Room 103 of the L.D.S. Church Office Building, 47 East South Temple in Salt Lake City, and is open from 8:30 a.m. to 5:00 p.m. Monday through Friday. Its collections contain publications of the Church, periodicals of the various auxiliary organizations, reports and histories of the various missions, general history of the Church, biographies of Church leaders, and other pertinent published and archival material.

## Evening School

On week-day evenings classes are conducted on campus in areas of interest to adults who desire to improve or enrich their lives through part-time education.

Regular university credit, equivalent to daytime classes, is given for all Evening School classes. Anyone wishing to do so may take a class on a non-credit basis as an auditor.

Class schedules, listing classes and giving detailed information about all procedures, are available free of charge upon request. Courses listed in the Evening School schedule which do not receive ten or more registrations will be cancelled. Students who have registered in cancelled classes are notified and invited to join other classes or are given full refunds.

Veterans are eligible to enroll under the G.I. Bill if they meet the eligibility requirements of the Veterans' Administration.

Day students may enroll in Evening School classes on their regular registration card by picking up cards marked "Section 90." An extra fee of $3 per credit hour is charged for these classes.

One dollar is charged for each change slip presented after the first week of the semester unless the action is initiated by the Evening School.

Each student registered through Division of Continuing Education who discontinues attendance at class must use the proper procedure to withdraw by coming to the Extension office.

A prorated refund of tuition fees is made to those who officially discontinue registration from evening classes within the time designated in the Evening School Catalog.

Students registering for evening classes only register from 5:00 to 9:00 p.m. on the dates announced in current schedules.

Evening School registration should not be confused with official admission to the Graduate School.

# *University Fees*

The University reserves the right to change these figures without notice.

All students who register will be expected to pay tuition and fees prior to or at time of registration.

Approximately 70 percent of the cost of operating the University is paid from the tithes of the L.D.S. Church. Therefore, students who are active Church members, already have made a monetary contribution to the operation of the University. To equalize this burden somewhat, it is necessary to charge nonmembers a higher tuition. Even this higher total payment, however, covers less than half of the total educational cost of nonmembers of the Church.

**Tuition and General Fees**

L.D.S. Church Members, full time (9 credit hours or more)

| | Fall Semester | Spring Semester | School Year |
|---|---|---|---|
| Tuition and Fees | $175 | $175 | $350 |

Nonmembers, full time (9 credit hours or more)

| | Fall Semester | Spring Semester | School Year |
|---|---|---|---|
| Tuition and Fees | $250 | $250 | $500 |

Part-time Students (graduate students taking fewer than 9 credit hours per semester)

(The tuition and fees paid as a part-time student do not entitle one to health service or student activity privileges.)

| | L.D.S. Church Members | Nonmembers |
|---|---|---|
| Minimum tuition and fees | $ 33.00 | $ 49.00 |
| 3 credit hours | 46.00 | 68.00 |
| 4 credit hours | 59.00 | 87.00 |
| 5 credit hours | 72.00 | 106.00 |
| 6 credit hours | 85.00 | 125.00 |
| 7 credit hours | 98.00 | 144.00 |
| 8 credit hours | 111.00 | 163.00 |

The charge for noncredit courses or for auditing courses is the same as for credit courses. Noncredit courses taken by part-time students will be assessed on the basis of hours involved in lecture classes. For example, three hours of lecture a week would be considered three semester hours and would be charged for accordingly. Therefore, if a student were taking 8 credit hours plus a noncredit class involving two or more lecture hours per week, he would be considered a full-time student and must register as a full-time student. For courses in which no lecture hours are involved—for example, doctoral dissertations—tuition and fees will be handled on an individual basis, to be resolved later.

A fraction of an hour is, for fee assessment purposes, counted as a full credit hour.

All graduate students who are not regularly registered but continue to use University services or facilities (including consultation with a major professor) will pay a special service fee of $20 per semester or $10 for each term of Summer School.

## PAYMENT OF FEES

All students registering are expected to pay full tuition and fees prior to or at the time of registration.

Included in the payment of tuition is a $10 deposit which is not refundable, even in the event that the student does not complete registration or attend school. For special students (those who do not carry nine or more hours) the nonrefundable deposit is $5.

## LATE REGISTRATION FEE

Late registration fees are assessed all regular and special students for failure to complete registration on scheduled dates. (No exception is made regardless of the reason for being late.)

Failure to complete registration on scheduled dates.

1. First five regular school days following the scheduled registration date ..... $ 5.00
2. After the fifth day following scheduled registration date ..... 10.00

Late fees for special students are assessed as 50 percent of the rate for regular students.

## MISCELLANEOUS GENERAL FEES AND FINES

| | |
|---|---|
| Graduation fee, master's or doctor's degree (Only 50% refunded if degree is not obtained.) | $20.00 |
| Late application for graduation fee (for those who apply after January 15 for June commencement and after March 15 for August commencement) | 3.00 |
| Identification photo | .50 |
| Change of registration fee, for each change slip presented after the first week of each semester | 1.00 |
| Change of grade fee (unless the change is the responsibility of the University) | 3.00 |
| Examination, special equivalency, per credit hour (the maximum fee in any one subject shall not exceed $45) | 7.50 |
| Duplicate activity card | 1.00 |
| Transcript fee ($1.00 for first copy on every order, plus $.50 for each additional copy) | 1.00 |
| Automobile registration and parking fee: | |
| Beginning of school year | 7.00 |
| Beginning of Spring Semester | 4.00 |
| One Term of Summer School | 2.00 |
| Two Terms of Summer School | 3.00 |
| Traffic violation fines | 1.00 to 5.00 |
| Special service fee for unregistered graduate students who are using University facilities: | |
| Each semester | 20.00 |
| Each term of Summer Session | 10.00 |
| Thesis binding (4 to 5 copies) | 11.00 to 13.75 |

Registration in Evening School. (All daytime students will be required to pay an additional fee of $3 per credit hour for all hours carried under the Evening School program.)

## FEES FOR INSTRUCTION IN MUSIC AND SPEECH

For fees in special private instruction in music and speech see the General Catalog, University Fees section.

## RENTALS

| | |
|---|---|
| Harp rental, one hour each day, per semester | $10.00 |
| Harpsichord, clavichord rental, one hour each day, per semester | 10.00 |
| Organ group | 10.00 |
| Organ rental, one hour each day, per semester | 15.00 |
| Piano rental, one hour each day, per semester | 7.50 |
| Each additional hour per day, per semester | 6.00 |
| Practice room without a piano, one hour each day, per semester | 4.50 |
| Each additional hour per day, per semester | 3.00 |
| Fine imposed on students who use rooms and have not paid the fee | 2.00 |
| Locker rental (McKay Building and Eyring Science Center): | |
| 1 semester | 1.50 |
| 2 semesters | 2.50 |
| 2 semesters and Summer Session | 3.00 |
| Key deposit | 1.00 |
| Replacement of lost key | 1.50 |

## DEPOSITS

| | |
|---|---|
| Gymnasium towel check and padlock deposit (Maximum refund is $2.50.) | $ 3.00 |
| Chemistry (each laboratory class) | 1.00 |

# *Student Academic Services*

## Office of Admissions and Records

The Office of Admissions and Records is primarily a service office for all Brigham Young University students. It is a service agency also to parents, to the faculty, to the State, and to various agencies eligible to receive information regarding student records.

Student academic services performed by the Office of Admissions and Records for the University include the following:

Admission of undergraduate students
Registration of students
Preparation of class schedules
Assignment of instructional space
Assignment of office space
Evaluation of foreign student credit
Graduation summary reports
Academic grade reports
Transcripts of University credit
Preparation of graduation lists

The dean of Admissions and Records has general supervision over the services listed above. It is his responsibility to initiate and to recommend regulations, policies, and procedures for implementing these student academic services and to administer the program of the Office of Admissions and Records as approved by the administration of the University.

## Admission

Students who apply for admission and who are accepted by Brigham Young University are required to maintain ideals and standards in harmony with those of the Church of Jesus Christ of Latter-day Saints.

**New Students.** All graduate students applying for admission to Brigham Young University will apply directly to the Office of the Graduate Dean. This includes nondegree-seeking students as well as degree-seeking students. Detailed requirements will be found on page 35 of this catalog.

Degree-seeking students should file their application for admission at least two months prior to the beginning of the semester in which the student plans to register. Nondegree-seeking students should apply at least 30 days prior to the registration dates.

All applications for admission including accompanying materials must reach the Office of the Graduate Dean not later than the deadline dates indicated below.

| Students who wish to enroll for | Must have submitted all admission materials by |
|---|---|
| Fall Semester | July 30 |
| Spring Semester | January 20 |
| Summer School | First Term - May 31<br>Second Term - June 30 |

Students who do not meet these deadline dates may not enroll until a subsequent semester.

**New Students from Foreign Countries.** To be admitted to the University a student from a foreign country must present proper credentials.

All persons, with the exception of English-speaking people on the American continent, whose applications are to be considered for Fall Semester must have their foreign-student forms received by April 15. Any requests received later than this will be automatically considered for the Spring Semester, which begins in February. Application requests for the Spring Semester will be accepted up to August 15 of each year.

**Former B.Y.U. Students.** All former B.Y.U. students who have discontinued day school for one semester or more must apply for readmission. Readmission applications are furnished upon request of graduate students from the Office of the Graduate Dean.

Students will not be readmitted after the deadline dates indicated under the above heading "New Students."

**Repeating Students.** Registration packets will be prepared for all students who were enrolled in day school at the University during the preceding semester.

**Summer School Students.** The same admission requirements as already outlined apply to new summer school applicants.

Those students who were in attendance in day school at either of the two previous summer sessions need not apply for readmission. Registration packets are prepared for them.

**Notice of Acceptance.** A notice of acceptance will be mailed promptly to all new and former students who have been accepted by the University. A student with deficiencies will receive an answer to his application for admission outlining the problems involved.

## Registration

**Registration Procedure.** Details of the registration procedure are outlined in the class schedule issued each semester by the Office of Admissions and Records.

**Time of Registration.** Students are urged to register on the days set aside for registration (see University Calendar). A late fee is charged for each student who does not complete his registration on the specified days. The term "registration" refers to the entire procedure, including the payment of fees. A student may enroll in any class during the first two weeks of the semester if he has the permission of the instructor of the class and approval of the dean of the Graduate School.

**Withdrawal from the University or From Specific Classes.** Students discontinuing registration at the University or withdrawing from individual classes are required to clear through the Office of the Graduate Dean.

a. If a student officially withdraws from a class the first two weeks of a semester, the permanent record will show no registration for the class in question.

b. A student who is doing passing work in a course may discontinue the class between the second and third week if such action is recommended by the teacher, the student's adviser, and the dean of the Graduate School. A grade of "W" will be assigned for the class. A student who is doing failing work in a course may discontinue the class after the first two weeks if he has the approval of his adviser and the dean of the Graduate School and the teacher's signature. A grade of "WE" counts the same as an "E" grade in computing the grade-point average.

c. If a student drops a class any time during the semester without officially withdrawing, he will receive a grade of "UW" (meaning unofficial withdrawal) in each course so dropped. This will indicate that the student has failed to clear officially with the University. A "UW" grade counts the same as an "E" grade in computing the grade-point average.

**Withdrawal from Evening School Classes.** Students who withdraw from classes for which they have registered in the Office of Continuing Education must do so by notifying that office and completing withdrawal forms. An evening school student who does not properly withdraw will receive a failing grade.

**Registration of Prospective Secondary Teachers.** All certificates for teaching, counseling, supervising, administration, and library work in the public schools of Utah are granted by the State Department of Public Instruction.

When all requirements for state certification have been fulfilled, students of the University who are registered in any of its colleges or in the Graduate School will be recommended for certification by the dean of the College of Education. This recommendation will be given just as readily to prospective secondary teachers who have registered in other colleges as to those who have registered in the College of Education; the dean of the College of Education acts merely in an administrative capacity as the representative of the University. However, all students in the teacher certification program, regardless of their college registration, are required to have an assigned adviser in the College of Education to approve the professional education sequence courses. Assignment of education advisers is made in the Teacher Certification Office.

Students who desire state certificates should make application with the dean of the College of Education through the Teacher Certification Office and not with the State Department of Public Instruction.

**Completion of Registration.** When the student has followed the prescribed registration procedure and has paid his fees, his registration is complete. The University will hold the student responsible for the completion of the courses for which he has been enrolled, unless he obtains approval for a change in registration or files an official withdrawal from the University.

**Complete Withdrawal from the University.** Any student withdrawing from the University after the second week must be doing passing work in his classes if he is to discontinue without academic failure.

## Records

**Classification of Students.** At the beginning of each semester students will be classified for that semester.

A student who has completed all requirements for the bachelor's degree is classed as a graduate student. A graduate student or a student holding a bachelor's degree from a four-year accredited institution may register at Brigham Young University as follows:

a. In the Graduate School under full degree-seeking status.

b. In the Graduate School as a nondegree student.

c. In the Graduate School as a nondegree student seeking a second undergraduate major.

**Credits.** A student may have credit entered on the books of the University as follows:

a. For work done in the regular courses offered by the institution.

b. For work done in an accredited university when such credit is to be used toward a graduate degree at Brigham Young University. Credit from other schools should be filed with the Office of the Graduate Dean upon application for admission to the University.

By paying of an auditing fee a student may obtain permission to audit courses of instruction. Under no circumstances can credit be obtained by means of special examinations for courses which have been audited.

**Grading System.** The present grading system uses the letters A, B, C, and , to indicate that the student receives credit, and E to indicate that no credit allowed.

The "A" grade is given only to students whose intellectual capacity and ctual academic achievement are of exceptional quality. Work of a quality somehat higher than average but not of exceptional quality receives a B+, B, or —. C+, C, or C— indicate that the student has completed classroom work, itside assignments, and examinations in an average manner.

Students who fail to reach the average academic achievement, but who do ork of a quality still acceptable to the University are given a D+, D, or D— rade. D+, D, or D— credit is not acceptable toward a graduate degree. Students ho fail to achieve work of minimum university quality receive an "E" grade. his grade mark draws no credit.

The letter "I" (incomplete) is used to indicate that the work is not yet cometed. It should be given **only** when special arrangements for the completion of e specific work involved have been made between teacher and student. The "I" ould never be given when the student has failed or is failing the course. A ade of "I" changes automatically to "E" in the Office of Admissions and Records less the work is completed within one year from date the grade is given.

Registration for the master's thesis including all research applicable to the esis, will carry Number 699. Each registration of 699 will include an timated amount of credit for a given semester. The total of all registrations der 699 will be not fewer than six nor more than nine semester ours. Following the final oral examination, the thesis and its defense will be ted and given a grade "P" (pass) or "E" (fail). The mark will then be forwarded om the Office of the Graduate Dean to the Records Office on the basis of inrmation received from the committee giving the final oral examination.

Projects, that are undertaken in master's-degree programs not requiring e thesis, shall be listed in registration under the number of a specific project urse within the department. When the project does not come from a specific urse but is completed under the direction of a regular advisory committee, e registration card shall carry the amount of credit authorized in a given mester.

The letter "P" (passed) is also used in connection with the student teaching ogram of the College of Education of the University.

No final grade once recorded in the Office of Admissions and Records shall changed except to correct the record when an error in calculation has been ade by the teacher, by the Data Processing Department, in the Office of dmissions and Records, or by action of the Academic Regulations Committee. hen such corrections need to be made, an official "Teacher Grade Change uthorization" form must be filled out; signed by the teacher, the chairman of e department, and the dean of the college; and sent directly to the Office of dmissions and Records.

# *Student Personnel Services*

The Student Personnel Services offer valuable assistance in the following areas that affect graduate students: academic standards, counseling service, foreign students advising, health services, Indian students advising, student organizations and social life, and student publications.

**Dean of Students.** The dean of students is director of the Student Personnel Services. He initiates and recommends to the President and the Administrative Council needed policies and procedures in student life. He administers the program and coordinates the agencies at work on student problems.

**Counseling.** It is the policy of Brigham Young University Counseling Service primarily to see students with a variety of problems (educational, vocational and personal-social problems) who can be helped in a relatively short period of time (about one semester). It is not the intent to engage in long term and/or intensive psychotherapy, but rather to promote the adjustment of students within the University setting. A primary goal of counseling is to help maturing students accept responsibility for the decisions arrived at in counseling and for their own behavior.

The staff of the Counseling Service is professionally trained in counseling psychology and related disciplines. Such training enables them to offer professional assistance with problems ranging from the selection of a major and vocation to rather intense emotional disturbance. Students utilizing the service can be assured of reliable professional assistance and complete confidentiality.

**Testing Services.** Tests of achievement, ability, interest, and adjustment are given to all students requesting them. The data from these tests are used as a basis for counseling in educational, occupational, and personal problems. The testing service provides psychological test data for the use of counselors and registration advisers; placement tests for various academic groups at the University; and assistance in the preparation, administration, and scoring of subject matter as requested by various departments in the University.

**Occupational Information Services.** A comprehensive, current collection of essential occupational information is maintained in the Counseling Service library. Current catalogs of major universities and technical schools are also on file. These materials are available to all students seeking information about particular vocational opportunities or information about employment in general.

**Foreign Students Adviser.** Services of the foreign students adviser are available to all students from countries outside of the United States. All alien students are expected to clear with him. Foreign students coming to the University should **report first to the Foreign Students Office** in the Abraham O. Smoot Administration and General Services Building.

## Student Health Service

The Howard S. McDonald Student Health Center accommodates the health services, comprised of out-patient clinics and an in-patient unit for cases requiring bed care. The center functions 24 hours daily, 7 days a week during schoo terms and is available to any regularly enrolled full-time student whose fee include those services for the semester in which he is registered. Summer stu dents are included. Medical care to all eligible students is limited to the facilitie and personnel in the health center.

**The following services are provided without extra charge:**

1. An entering physical examination is offered if requested by the studen or the parents of the student within the first two weeks of the semeste

2. Consultation with general physicians and specialists (by appointment) in the health center during regular clinic hours, 8:30 a.m. to 4:30 p.m. This includes specialty clinics in orthopedics, general surgery, gynecology, internal medicine, chiripody, and ear, nose and throat.
3. First-aid treatment any time during the 24 hours of each day.
4. Immunizations as required for small pox, diphtheria or a tine test for tuberculosis.
5. Physical therapy as recommended by a health center physician.
6. Routine laboratory tests.
7. Seven days of bed care in any one semester in the health center, as recommended by a health center physician, after which a minimum charge of $10.00 per day is made.
8. Within the limits of its personnel and facilities, and at the discretion of the director, the treatment of chronic disease suffered by students.

**Some services require an additional charge and are supplied to the student at cost. These are services in this category:**

1. Meals while the patient is in the center.
2. Drugs on prescription of a health center physician.
3. Special diagnostic laboratory tests.
4. Special immunizations, i.e., poliomyelitis, influenza, etc.
5. X-rays other than "screening" films. The health center regularly employs the technical personnel to take and a radiologist to interpret the x-ray films. The student pays only the cost of the materials.
6. After-hour calls made by a physician in the clinic. The student pays $5 for each call.
7. Rental of crutches.
8. Immediate notification of parents or guardian by the health center when a student is taken ill.

**ıese services are not available:**

1. Major surgery or off-campus hospitalization or medical care.
2. Dental service.
3. Obstetric service.
4. Eye refractions, glasses, prostheses, hearing aids, etc.
5 Routine physical examinations.

### STUDENT HEALTH AND ACCIDENT INSURANCE PROGRAM

To compliment the services of the Student Health Center a supplemental in-rance program is offered, which is available to all full-time students. This vol-ıtary program, fully endorsed by the University, provides for a wide range of edical services at minimal costs. All students not otherwise protected by a ealth insurance plan are urged to accept this excellent plan specifically designed r our students. Full details are available from the health center.

## University Standards

The maintenance of standards of honor and integrity, of graciousness in rsonal behavior, of Christian ideals in everyday living, of a high standard of orality, and of complete abstinence from alcohol and tobacco is required of ery student. The maintenance of standards as stated is applicable on the ımpus, at home, or wherever the individual may be as long as he is in stu-ent status. Registration signifies a student's willingness to conform his life to ıese standards.

Any pronouncement of disciplinary measures made by the President of the niversity becomes a part of these regulations. Violations of these regulations ake the offender liable to suspension or expulsion from the University.

Veterans' Service. All veterans should have their military experience evaluated for credit by applying to the Office of Admissions and Records.

For further information concerning any educational benefits problem, please write to Veterans' Coordinator, Abraham O. Smoot Administration and General Services Building, Brigham Young University, Provo, Utah.

# *Other Services to Students*

## Placement Center

The Placement Center, located in the Abraham O. Smoot Administration and General Services Building, assists graduating students and alumni to find desirable positions in their fields in business, industry, government, and education. This office works in close cooperation with deans and department chairmen.

The placement service includes a placement library where interested students may find books, articles, magazines, and brochures that will acquaint them with companies in which they may be interested and also books and pamphlets which will give advice on such matters as how to conduct oneself in an interview, how to write effective letters of application, how to find employment, etc.

All students are urged to register with the Placement Center early in the school year in which they will graduate. Early registration will enable that office to give the most effective possible assistance in finding employment for each graduate.

## Student Employment

In the Placement Center, assistance is given to students in finding part-time employment. This includes help not only in placing students in positions on the University campus but also in finding part-time employment off campus and in finding work for board and room.

Students are encouraged not to attempt to earn their entire way through school. Such a program leaves little time for academic work (see scholarships). Furthermore, it is important to note that there is a maximum limit on the number of hours which a student may work on campus.

Students needing employment are urged to register with the Placement Center as soon as possible after they arrive in Provo and are available for work. Need weighs most heavily in deciding who shall receive leads for jobs. Hours available and possession of skills required by employers are also very important. Inasmuch as the number of students seeking part-time work is very high, those whose need is great are requested to report regularly at the Placement Center after filing their initial applications.

Students from foreign countries are required to obtain a work permit before they may take employment. Such students may receive assistance in obtaining the necessary permit from the foreign student adviser.

## Religious Opportunities

Brigham Young University students have excellent opportunities for participation in religious activities. Among the means available are the following:

**Brigham Young University Stakes.** There are six Brigham Young University stakes. Each stake has a number of wards, usually between 200 or 300 members, organized specifically for students, providing maximum opportunity for active participation in the program of the Church. Spiritual growth and the development of a strong testimony are goals fostered by the stake and ward organizations, whose programs are closely integrated at all levels with that of the University.

All single students living away from home establish their membership records one of the wards of the stake. Married students who attend the University d do not live in University housing, may elect to have their membership re- rds either in a ward of one of the B.Y.U. stakes or in a nearby ward in which ey reside. Membership records of students remain in B.Y.U. stakes until they rminate their schooling at the "Y."

**Religious Organizations.** In addition to the stakes and wards on campus we ve several organizations that are primarily religious in nature and also are cial and service groups.

**Devotional Assemblies.** Devotional assemblies, held each Tuesday, enable udents to hear messages of spiritual power and depth from Church leaders. is contemplated that during each year members of the First Presidency and the Quorum of the Twelve Apostles will address the student body in the esday devotional assemblies.

## Security and Traffic

The Security Office is a protective agency established for the benefit of stu- nts, faculty, and staff. It maintains effective liaison with the local police de- rtment, and is entrusted with the proper enforcement of campus rules and gulations. All matters concerning security or requiring police action should be ferred to this office.

Another major responsibility of the Security Office is the control of campus hicle traffic and parking. In each academic year University staff members and udents who operate vehicles in Utah County regularly or occasionally shall gister any such vehicles with the University Traffic Department. In the case of udents this is a registration for identification only, not a parking permit. All aff members and students who plan to park on University parking lots between a.m. and 5 p.m. on school days must display a parking permit on their motor hicles. The student parking fee for motor vehicles is $10 per year or $6 per mester.

The Security Office also offers many other services to students and staff embers; the taking of fingerprints necessary for teaching certificates, govern- ent jobs, and A.F.R.O.T.C.; and an ambulance service in connection with the udent Health Center.

All campus roads will be closed on Christmas Day each year to preserve the ivate ownership thereof.

## Lyceums and Forums

Almost since its founding Brigham Young University has been bringing to students distinguished men and women in arts and letters. The lyceums, ually evening programs, are of cultural value. Forum assemblies, held each ursday morning, feature speakers and artists who can offer students a better derstanding of our contemporary civilization.

# *Student Housing*

Learning to live harmoniously with other people under the right kind of living conditions plays a vital part in a college education. Students living in groups, working, studying, and enjoying recreation together gain much from each other. The conversations, good fellowship, and activities experienced in group living contribute to a person's whole development. Participation in democratic, self-governing living activities brings about a phase of education which can be gained in no other way.

The Office of Student Housing, established to assist students with their housing needs, is located in the Abraham O. Smoot Administration and General Services Building. All inquiries or administrative problems relating to housing needs should be referred to this office.

## Campus Housing

### Residence Hall Supervision

Each area of campus housing is organized under the supervision of a person with professional training and experience for this type of work. The residence hall staff carries out a residence hall program designed to provide each student with experiences in democratic self-government, development in acceptance of responsibilities that go with maturity and independence, and assistance in learning the art and science of human relationships in working and living with others. The staff assists the student to achieve a sense of belonging and to develop social competence through planned social and recreational programs. Head residents are available for general counseling. They carry out the residence hall program in cooperation with other University academic services.

### Applications

A student who plans to enroll at the University and live in a University residence hall should make inquiry to the Office of Student Housing about a year in advance. A housing application form will be sent to each inquiring student. A $10.00 application fee is required and should be enclosed with the completed application form when it is returned to the Office of Student Housing. A residence hall assignment and appropriate agreement forms are prepared on a basis of the date of receipt of the application form by the housing office and are mailed in the late spring and early summer.

### Acceptance to University

The validating of any campus housing reservation is contingent upon the student's official acceptance and admission to the University. For admission to the University contact the Admissions Office, A-183 Abraham O. Smoot Administration and General Services Building.

### Rental Agreements

A student planning to live in campus housing may expect to sign a rental agreement for the accommodations he will occupy. He should be prepared to live by the terms of this agreement once he has signed and returned it to the Office of Student Housing. Misunderstanding and financial loss can be avoided by a student if he will read and familiarize himself with the terms of the agreement before signing.

### Graduate Housing for Men

Housing arrangements have been made for graduate students in a special area of the New Residence Halls. The approximate rate, including meals, is $65[illegible] A few single rooms are available at $700.

### Apartments and Homes for Married Students

Family accommodations for 348 married couples and their children are rovided in housing developments known as Wyview Village and Wymount errace. All units in married-students' housing are assigned according to family ize.

Wyview Village consists of 150 prefabricated homes purchased in 1956 from federal government air base and moved to a site adjacent to the campus. here are 100 two-bedroom and 50 three-bedroom homes. The monthly rental ates are approximately $52.50 for the two-bedroom and $57.50 for the three-edroom homes. In addition, each family pays for its electricity.

Wymount Terrace—which includes 24 residence buildings, an administration uilding, and 3 laundries—consists of 462 apartments. Of this number 198 partments will house married students. There are 48 one-bedroom units, 24 ne-bedroom-study units, and 126 two-bedroom units. The monthly rental rates re approximately $60.00 for the one-bedroom units, $66.00 for the one-bedroom-tudy units, and $70.00 for the two-bedroom units. In addition, each family pays or its heat and electricity. Balconies or porches for all apartments open on court-ards. Apartments have bedrooms, an all-tile bathroom, kitchen with modern ppliances, including garbage disposal units, gas ranges, and electric refriger-tors, and an attractively decorated living room.

The Residential Housing Office can assist those who desire to live off cam-us to find a suitable apartment in the Provo community.

### Apartment Living for Women

Housing for women is provided in 24 Heritage Halls. These are apartment-ype buildings. Each apartment consists of a combination kitchen-dining-study oom arrangement, three bedrooms and a bath. In addition, there are large living ooms, a recreation room, head resident apartment, and laundry and storage acilities in each building. Six girls occupy an apartment and live cooperatively, reparing their own meals. The apartments are completely furnished except for edding, kitchen utensils, and dishes. The facilities are excellent and offer a high tandard of living for college students. The approximate annual rate for these ccommodations is $265. Food is purchased cooperatively by the residents of ach apartment.

Help in the homemaking experiences of budgeting, buying, meal planning, nd the selection, care and construction of clothing is available from specialists vho are assigned to Heritage Halls. In addition, a specialist is available to assist tudents in planning social activities, developing recreational skills, and learning vise use of leisure time.

Special arrangements have been completed to accommodate single women tudents in the new Wymount Terrace apartments. There are 462 apartments in Vymount Terrace, the new married student housing project. Of this total 452 paces will be used to accommodate women students.

The Wymount Terrace apartments vary in size from one to three bedrooms. Girls will be housed in groups of three to six, depending on the size of the unit, nd will share in a group-living experience similar to that of Heritage Halls, vith adequate head-resident supervision in each building.

Wymount Terrace apartments are located two blocks north of Heritage Halls on Ninth East. The apartments are furnished except for bedding, kitchen tensils, and dishes. The approximate annual rate is $265.

Each woman student desiring to live on campus should consider carefully he type of accommodations desired in view of her economic needs, time available or activities within her housing situation, and type of experience desired. Agree-nents are made for the academic year, and moving from one type of accommoda-ion to another during the year is difficult to arrange.

### Residence Halls for Men and Women

Board and room services for men and women are provided in seven buildings known as Helaman Halls and five new buildings in Deseret Towers. These build-ings form a beautifully designed residence hall development. The residence hall

buildings are conveniently grouped around an attractively planned and developed central building. Each residence hall accommodates 234 to 264 students, with two persons sharing each bedroom. In addition, living rooms, study rooms, central shower areas, recreational rooms, adequate laundry and storage facilities, and a head resident apartment are found in each building. These halls provide some of the best student living experiences offered on any university campus. The central building features spacious dining rooms and a snack bar, providing the excellent food service for which B.Y.U. is noted. This building also contains beautiful living rooms, recreational areas, administrative offices, and other management facilities such as mail rooms and laundry and dry cleaning pick up stations. The approximate annual rate for these accommodations is $650. A few single rooms are available at an approximate rate of $700.

## Residential Housing

All students living off campus are required to live in University-approved housing. The Residential Housing Department of the Office of Student Housing maintains up-to-date listings of approved residences. This office is established to assist students upon their arrival in Provo to find suitable quarters if they desire to reside in the community.

Residential housing consists of apartments, rooms with kitchen privileges, board and room, and sleeping rooms located in homes in the community. These facilities are inspected by University representatives to see that they comply with established standards before they are approved for student occupancy. Through the cooperative efforts of landlords and the University, constructive action has been taken to raise the standard of student housing throughout the community. Before making any commitments for residential housing, students should make sure that the place in which they contemplate living has been approved by the University.

A student planning to reside in the community should expect to sign a student-landlord rental agreement form which will be furnished by the University Housing Department. He should be prepared to live by the terms of this agreement once it has been signed, and a copy should be returned to the Office of Student Housing. Misunderstanding and financial loss can be avoided if the student will read and familiarize himself with the terms of the rental agreement form before signing.

### Rates

Rates for residential housing accommodations vary with the type of service provided; consequently only a general indication can be given here. Sleeping rooms rent from $20 to $30 a month. Apartment accommodations run from $20 to $40 per month per student. Board and room is available at the rate of $55 to $70 a month. Apartments for married students can be obtained at a rate of approximately $45 to $70 per month.

### Time of Arrival

Residence halls are not open to a student prior to the announced opening date, usually the day before freshman orientation. The University does not advise a student who is going to live in campus housing to arrive before that date. It is unwise for a student with nothing to do to live in a hotel or motel where there is no University supervision.

## Food Service

Regular meal service is provided for students at six different cafeterias on campus. Five of these are operated as part of the board-and-room service of residence halls. It is possible for students living off campus to buy meal tickets at reduced prices and eat in four of these places. The sixth cafeteria is in the Ernest L. Wilkinson Center, where meals are served at reasonable prices either for cash or by reduced rate scrip books. In addition, by contacting the Office of Student Housing, board-and-room students may participate in a supplementa

food program costing approximately $80 a year more than the regular board-and-room rates.

The University operates four snack bars: one in the Ernest L. Wilkinson Center, a second in the George Albert Smith Fieldhouse, a third in the Helaman Halls Cannon Center, and a fourth in Deseret Towers. Food is available through the day. Food also may be secured from vending machines located throughout the campus. Costs of meals and food service are kept as low as possible, consistent with sound operating management.

The University also operates a dairy products laboratory where milk, ice cream, and other dairy products may be purchased by students and faculty at very favorable prices. Students preparing their own meals find this service both desirable and economical.

**Ernest L. Wilkinson Center Cafeteria**

# *List of Courses*

## General

**Semester System.** Courses of study at Brigham Young University are offered and credit for satisfactory completion is granted on a semester basis.

**Course Numbering System.**

| Course Number | Type of Course |
|---|---|
| 500 to 599 | Advanced undergraduate or graduate |
| 600 to 799 | Graduate |

**Credit Hour Designation.** The three-number code for credit hours, listed in parentheses following the course title, has the following significance:

| | |
|---|---|
| First number: | Semester hours of credit |
| Second number: | Class hours of lecture, recitation, or seminar meeting per week or<br>minimum hours of individual study required per week |
| Third number: | Laboratory hours required per week or<br>hours of field study or individual research per week |

**Abbreviations and Symbols.** The following abbreviations and symbols are used in the List of Courses Section:

| | |
|---|---|
| Arr. | Class or laboratory hours arranged |
| ea. | Credit-hour designation applies to each course number listed |
| F.,S.,Su | Fall or Spring Semesters or Summer Session |
| * | In Administration and Faculty section and in departmental faculty listings, faculty member on leave |
| □ | Course originating in one department which may count for credit in another department |

**Cross Referencing of Courses.** Each course is listed completely only once in the catalog. If the course may count in another department, it is listed in abbreviated form in that department and is preceded by a special symbol, □

**Graduate Courses.** No graduate credit is given for such courses with a lower grade than "C". Neither lower division nor correspondence credit can be applied toward a graduate degree.

**Reservation of Right to Change Courses.** At the time of printing of this catalog, the University intends to give the courses listed herein, but reserves the right to eliminate or discontinue any of them or to add new courses.

Professors listed under each department title include members of the graduate faculty only.

# Accounting

**Professors:** Andersen, Orton (chairman, 350 JKB), Skousen (coordinator, Graduate Studies, 342 JKB), Smith.
**Associate Professors:** Johnson, Taylor.
**Assistant Professor:** Woodfield.

## Requirements

### Master of Accountancy Program

The professional degree, Master of Accountancy (MAcc.) is offered by the Accounting Department. The program is available to those with undergraduate degrees in accounting or in other departments. The following courses or their equivalents must have been taken prior to entering the program or must be taken without being applied to the credits required in the Master of Accountancy program.

Acctg. 201, 202, 301, 302, 312, 342
Econ. 111, 112
Bus. Mgt. 347, 348
Math. 108
Stat. 221

Specific requirements for the Master of Accountancy degree include:

(1) Completion of at least 32 hours of graduate or properly approved upper division work. The program is to be approved by the student's advisory committee and the coordinator of graduate studies during the first semester of work. These 32 hours of work must include the following: (a) Acctg. 512 or 612 (Cost Accounting), (b) Acctg. 615 (Controllership), (c) Acctg. 675 (Theory of Accounts and Statements), (d) Acctg. 691, (Research Seminar). The student may elect to write a thesis (Acctg. 699) instead of taking Acctg. 691; a minimum of six hours credit is required for a thesis.

(2) The 32 hours listed in (1) above must include a minor of 9 or more hours of work in a selected graduate field in any department of the university, such minor to be approved by the coordinator of graduate studies in accounting and the advisory committee. In lieu of a minor in one field, work in fields relating to accounting may be elected. If this choice is made, at least 6 hours of work must be selected from such related areas and a maximum of 12 hours of such work will be accepted toward the 32-hour requirement upon approval of the advisory committee and the coordinator of graduate studies. It is recommended that students electing the related field area take Bus. Mgt. 690 (Seminar in Financial Management) or Bus. Mgt. 691 (Seminar in Financial Institutions) as a part of their course work. Following is a list of courses in related areas from which selection may be made but other courses may be used upon special petition and approval of the coordinator of graduate studies and the graduate dean:

**a. Business Management.**
(1) 420 Human Relations in Administration I (3 hours).
(2) 521 Human Relations in Administration II (3 hours).
(3) 450 General Insurance (3 hours).
(4) 565 Life Insurance (3 hours).
(5) 566 Property and Casualty Insurance (2 hours).
(6) 451 Investments (3 hours).
(7) 574 Investment Management (3 hours).
(8) 567 Real Estate Administration (2 hours).

(9) 577 Business Enterprise and Moral Responsibility (2 hours).
(10) 585 Industry Analysis (3 hours).
(11) 589 Business Policy (3 hours).
(12) 591 Research and Diagnosis of Business Problems (1-2 hours).
(13) 480, 481 Executive Lectures (1 hour). (Attendance at seminar with lectures also required.)
(14) 690 Seminar in Financial Management (3 hours).
(15) 691 Seminar in Financial Institutions (3 hours).

**b. Economics.**

(1) 311 Income Analysis (3 hours). (Permitted only if not taken for undergraduate credit.)
(2) 312 Price Analysis (3 hours). (Permitted only if not taken for undergraduate credit.)
(3) 358 International Trade and Finance (3 hours).
(4) 658 Advanced International Trade and Finance (3 hours).
(5) 402 Real Estate and Urban Land Economics (3 hours).
(6) 411 Theory of Income, Employment, and the Price Level (3 hours).
(7) 611 Advanced Theory of Income, Employment, and the Price Level (3 hours).
(8) 412 Theory of Price (3 hours).
(9) 612 Advanced Theory of Price (3 hours)
(10) 453 Money and Banking (3 hours).
(11) 461 Labor Relations (3 hours).
(12) 462 Economics of the Labor Market (3 hours).
(13) 475 Government Finance (3 hours).
(14) 675 Advanced Government Finance (3 hours).
(15) 476 Government and Business (3 hours).
(16) 415 History of Economic Thought (3 hours).
(17) 615 Advanced History of Economic Thought (3 hours).

**c. Statistics.**

(1) 330 Statistical Methods Used in Business (3 hours).
(2) 501 Statistics for Research Workers (3 hours).
(3) 432 Quality Control and Industrial Statistics (3 hours).
(4) 433 Operations Analysis (3 hours).
(5) 534 Advanced Theory of Sampling (3 hours).
(6) 690A Special Topics in Statistics (3 hours).

(3) Successful passing of a written comprehensive examination to be given before the oral examination may be scheduled.

The regulations of the Graduate School as given elsewhere in this catalog will apply to the following: (1) admission to the Graduate School; (2) graduate credit for seniors; (3) transfer credit; (4) student load; (5) scholastic standards; (6) advisory committee; (7) English 99; (8) course outline and revision sheets; (9) amount and distribution of credit, except as modified above in regard to the total number of hours required; (10) thesis requirements, when the thesis is elected; and (11) final oral examination.

**Three-Year Master's Degree Program.** The department also offers the Three-Year Master's Degree program. Students are permitted to enter this program at the beginning of their junior year in college and complete the program at the end of one year in Graduate School. Details of this program may be obtained from the coordinator of graduate studies in accounting.

## Courses

501. **Advanced Accounting.** (3:3:0) (Offered alternate semesters including summer) Prerequisite: Acctg. 302.
Includes joint ventures, consignments, installments, receiverships, estates and trusts, statement of affairs, and municipal and governmental accounting.

502. **Advanced Accounting.** (3:3:0) (Offered alternate semesters) Prerequisite: Acctg. 302.
Home office and branch accounts and parent and subsidiary accounting.

503. **Accounting for Nonprofit Organizations.** (3:3:0) (Offered 1967 and alternate years) Prerequisite: Acctg. 302.
Accounting concepts and methods peculiar to governmental units, universities, hospitals, and other nonprofit organizations.

521. **Advanced Tax Problems.** (3:3:0) (Offered alternate semesters) Prerequisite: Acctg. 420.
Advanced study of federal income tax, estate and gift taxes, and special problems in corporate taxation.

555. **Data Processing Systems.** (3:3:0) F. Prerequisite: Acctg. 356.
Principles governing design and installation of accounting systems and the selection of equipment for optimum performance in data processing cycles.

557. **Advanced Computer Programming.** (3:1:3) S. Prerequisite: Acctg. 356.
Emphasis on the solution of practical problems in data processing. Individual work on the University's computer and comparison of various computers in current use.

596. **Accounting Internship.** (1-3:3:Arr.) F.S.Su. Recommended: Acctg. 465.
Internship must be arranged in advance with department and company.

612. **Managerial Cost Accounting.** (3:3:0) (Offered alternate semesters) Prerequisites: Acctg. 302 and 312.
Study of specialized areas in cost determination and cost allocation.

615. **Controllership.** (3:3:0) (Offered alternate semesters) Prerequisites: Acctg. 302 and 412 or 612.
Organization of controller's office, control techniques, interpretation of data, and policy formulation.

621. **Tax Research and Planning.** (3:3:0) (Offered alternate semesters) Prerequisites: Acctg. 420 and preferably Acctg. 521.
Research and solving of tax problems using the tax code, regulations and other sources.

675. **Theory of Accounts and Statements.** (3:3:0) (Offered alternate semesters) Prerequisites: Acctg. 302 and 312.
History and development of accounting and financial statements, their meaning and interpretation. Problems in current accounting theory will be considered.

686, 687. **C.P.A. Problems.** (3:3:1 ea.) F.S. Prerequisites: Acctg. 302, 420; completion of or concurrent registration in Acctg. 465, 501, and 502.
Preparation for professional examination.

691. **Research Seminar.** (1-3:1-3:0) F.S.Su. Prerequisite: approval of graduate advisory committee.
Seminar in current topics. Includes writing a research paper in proper form.

693. **Reading and Conference.** (1-2:1-2:0) F.S.Su.
Subject to be arranged with instructor.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
This course number should also be used for continuing registration by students working on theses.

# Agricultural Economics

**Associate Professor:** Corbridge (chairman, 370 HGB).
**Assistant Professor:** Infanger.

### Requirements

A graduate degree is not offered in agricultural economics, but graduate credit in the following courses may be applied toward a minor in a field closely related to agricultural economics.

### Courses

525. **Production Economics.** (2:2:0) S. Prerequisite: Econ. 346. Corbridge
Principles concerning the optimum combination of productive resources within the farm firm and between firms.

☐**Statistics 531. Experimental Design.** (3:3:0) Arr.

580. **Advanced Agricultural Policy.** (2:2:0) S. Prerequisite: Econ. 346. Infanger
The theoretical and institutional setting of the agricultural industry, the objectives of farm policy, and the means of achieving these objectives. Includes a study of existing and proposed farm legislation.

590. **Seminar.** (1:1:0) S.

595. **Individual Readings.** (1-3:Arr.:Arr.) F.S.

597. **Individual Research.** (1-3:Arr.:Arr.) Arr.

☐**Economics 612. Theory of Price.** (3:3:0) F.

☐**Economics 658. International Trade & Finance.** (3:3:0) S.

# Agronomy

**Professors:** Allred, Farnsworth (chairman, 173 B), Laws.

### Requirements

The requirements for admission as a graduate major in agronomy, leading to the Master of Science degree, are the general requirements of the Graduate School and the previous completion of an undergraduate major in this field or a closely related field. Students with a major in chemistry, geology or physics may be accepted for a Master of Science degree in agronomy upon completion of certain basic courses in the department.

A student preparing for graduate work in agronomy is urged to obtain a thorough knowledge of introductory physics, chemistry, botany, mathematics, bacteriology, and geology. A student may be required to take additional undergraduate courses if found to be deficient in foundation courses.

Students receiving the Master of Science degree in agronomy must complete a research project and submit a thesis.

### Courses

605. **Chemistry of Soil-Plant Relationships.** (4:3:3) S. Laws

607. **Soil Physical Conditions.** (3:2:3) F. Laws

14 **Advanced Soil Microbiology.** (3:2:3) F. Prerequisites: Agron. 305, Bact. 121, Chem. 223. Farnsworth

59. **Advanced Plant Breeding.** (2:2:0) S. Allred

94. **Seminar.** (1:1:0) F.S.Su.

97. **Research.** (Arr.) F.S.Su.

98. **Agricultural Literature.** (Arr.) F.S.Su.

99. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

# Animal Science

**Professors:** Shumway (chairman, 280 HGB), Cannon, Morris.
**Associate Professors:** Hoopes, Wallentine.
**Assistant Professor:** Park.

### Requirements

A student contemplating graduate study in animal science must have eceived his bachelor's degree in this field or have completed courses with an quivalent background. His undergraduate courses should have included approxnately 35 hours taken from the following subjects or their equivalent:

Bact. 121, 321, 331, 371, 501
Bot. 101
Chem. 101, 111, 112, 113, 151, 321, 351, 352, 384, 581, 582
Stat. 221, 336
Zool. 365, 376

The student may select his minor field from among the following areas: gricultural economics, agronomy, bacteriology, botany, chemistry, education, or ology.

All students seeking a master's degree in animal science should enroll in nglish 99, a noncredit course, "Problems in Thesis Writing."

### Courses

07. **Animal Nutrition.** (3:3:0) S. Park

15. **Advanced Animal Breeding.** (3:3:0) S. Park

25. **Meat and Food Processing Plant Operations.** (2-6:½-1½:10-30)

Statistics 531. **Experimental Design.** (3:3:0) Arr.

60. **Advanced Dairy Production.** (3:3:0) S.

92. **Seminar.** (2:2:0) F.S. Cannon
A critical review and analysis of current research, findings, and methods in animal agriculture.

01. **Experimental Animal Techniques.** (2:2:0) F.S. Prerequisite: Stat. 221. Cannon

60. **Advanced Livestock Management.** (2:1:3) S.

91A,B,C,D. **Animal Science Research.** (1-2:0:3-6 ea.) F.S.

99. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Archaeology

**Professor:** Jakeman.
**Associate Professor:** Christensen (chairman, 139 M).

### Requirements

Admission as a graduate major in archaeology, leading to the Master of Arts degree, ordinarily requires the previous completion of an undergraduate major in this subject. Students desiring admission will be examined by the department. If admitted, the student may be required to take additional undergraduate courses which the department considers necessary to complete his background.

The following courses in this department are required of the candidate for the master's degree majoring in archaeology (unless previously taken for undergraduate credit): 551, 571, 690, and 695 or 696.

A thesis is required of the candidate for the master's degree majoring in archaeology. It may be either a field report or an interpretative study and must present worthwhile new data or concepts, must be of professional caliber, and must be suitable for publication.

The candidate for the master's degree in archaeology is required to present a reading knowledge of German, French, or Spanish. If he desires to substitute some other language in fulfillment of this requirement, he must demonstrate its pertinency to his thesis subject.

### Courses

**500. History and Theory of Archaeology.** (2:2:0) F. Christensen
A survey of the historical development of archaeology, with special attention to the theoretical foundations upon which this discipline has been built.

**551. Methods of Archaeological Research: General and Field.** (4:0-2:4-8) F. Christensen
The steps in an archaeological research project; an introduction to field and laboratory methods, including student excavation of a site in Utah Valley.

**571. Methods of Archaeological Research: Interpretative.** (2:2:0) S. Prerequisite: Archaeol. 551. Jakeman
Interpretation of empiric archaeological data as to culture units and their character and content; methods of chronological interpretation; and practice in archaeological ethnography and historiography.

**590. Recent Developments in Archaeology.** (2:1:4) S. Jakeman
Includes an individual report on recent work in a field of the student's choice.

The emphasis of the following courses is on the two fields of archaeology bearing upon the fundamental problem of the origin of civilization in the Old and New Worlds; i.e., Near Eastern and Middle American-Andean archaeology.

An undergraduate minor in archaeology or its equivalent is the general prerequisite to these courses.

A course in Akkadian, Egyptian hieroglyphics, or Hebrew inscriptions should, also, if possible, be taken before the course "Library Research in Near-Eastern Archaeology" (695), while the reading of ancient Maya and Aztec hieroglyphics (631) should also, if possible, be taken before the course "Library Research in Middle American-Andean Archaeology" (696).

**631. Introduction to the Reading of Maya and Aztec Hieroglyphics.** (3:1:6) F. (Not given this year) Jakeman

**641. Museum Methods and Teaching of Archaeology.** (3:1:6) (Not given this year) Prerequisite: an undergraduate minor in archaeology. Christensen
In-service training in archaeological museum methods and the teaching of archaeology.

651. **Advanced Field Methods of Archaeology.** (5:0:15) S.Su. Prerequisite: Archaeol. 551.
Further in-service training in field methods as a member of a Brigham Young University archaeological expedition to Middle America or the Near East.

690. **Seminar in Historic Archaeology.** (2:2:0) S. Must be taken concurrently with either Archaeol. 695 or 696, or both. Jakeman
Problems in historic archaeology, particularly the archaeology of the scriptures.

695. **Library Research in Near-Eastern Archaeology.** (2:0:6) S. May only be taken concurrently with Archaeol. 690.
Independent library research in oriental or biblical archaeology (Mesopotamian, Iranian, Egyptian, Syro-Palestinian, general oriental, or general biblical).

696. **Library Research in Middle American-Andean Archaeology.** (2:0:6) S. May only be taken concurrently with Archaeol. 690.
Independent library research in Middle American or Andean archaeology (Mesoamerican or Peruvian archaeological and chronicled history, Mesoamerican hieroglyphic decipherment, or origins of Middle American-Andean civilizations).

697. **Field Research.** (5-10:0:15-30) S.Su. Prerequisite: Archaeol. 651 (may be taken concurrently)
Participation in an archaeological excavation in Middle America or the Near East, with opportunity for independent field research at the same or a nearby site.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) S.Su. Prerequisite: Archaeol. 571.

# Art

**Professors:** Gunn, Andrus, Mathews.
**Associate Professors:** Turner (chairman, C502 HFAC), Weaver, Wilson
**Assistant Professor:** Darais.

### Fields

1. Painting and sculpture.
2. Design (ceramics, crafts, commercial art, printmaking, interior design).

### Requirements

A student expecting to major in painting and sculpture or design should have an adequate background in basic drawing, elementary design, and twenty semester hours of upper division work including art history. A student may take both his major and minor in the Department of Art. A departmental qualifying examination is required of all graduate students in art. If he is deficient in foundation training, opportunity may be given to correct this deficiency after he enters Graduate School.

Please review carefully the information listed under **Master's Degree** in the section titled **General Information** of this catalog.

### Master's Degree

The Art Department offers a Master of Arts degree. At least fifteen semester hours, exclusive of thesis, must be in one of the fields listed above, and at least nine semester hours in a minor field. A thesis and oral examination are required.

### Master of Fine Arts Degree

At least forty-eight hours are required in one of the fields listed above and at least twelve semester hours in a minor field. The candidate will meet

with members of the graduate art faculty to discuss his qualifications for candidacy as evaluated by means of a portfolio and graduate examination. At least ten graduate or undergraduate hours of art history are required. Art 629, Advanced Design, and Art 690, Color, are required of all students. The schedule must be completed in residence within a period of six years with an average grade of B or higher. The candidate's progress will be reviewed by the graduate art faculty at the end of each semester. Toward the end of the third semester of his program the candidate will demonstrate his proficiency in his chosen field and a supporting creative field by means of a one-man exhibit of art produced during this program. Before beginning the fourth semester of his program the candidate will submit to the graduate art faculty plans for a terminal M.F.A project. The project is a final work of art created by the candidate and, to be acceptable, it must represent a professional level of quality and the candidate's peak of achievement during his M.F.A. program. It may be retained by Brigham Young University as part of its permanent collection. Although a thesis is not required, an orderly record in which the M.F.A. candidate traces by means of personal statements, photographs, transcripts, news clippings, etc., his aesthetic development during his two years of the M.F.A. program is necessary. It also includes a photographic record and written account of the production of the candidate's terminal project.

### Courses

**444. Portfolio Preparation.** (2:2:2) S.F. Prerequisites: Art 122, 239, 341, 342. Gunn
An analysis of individual strengths and weaknesses. Specialization opportunities provided in various areas of commercial design and display. Preparation of portfolio emphasized.

**446. Advanced Commercial Art.** (2:2:2) S.F. Prerequisite: Art 444. Gunn
Professional standards in a specialized field of commercial art emphasized. Students judged proficient by a faculty committee are given experience in a practicing agency.

**501. Aesthetics.** (2:2:0) S. **de Jong**
Theoretical and practical criteria of aesthetic values.

**506. History of Architecture.** (2:2:0)

**580. Mural Design.** (2:2:2) F. Prerequisites: Art 310, 321 or 322. Darais
Historical backgrounds, design, and execution of murals.

**582. Mural Painting.** (2:1:3)

**595. Seminar.** (1:0:2) F.S.

**615. Period Furnishings and Other Decorative Material for Interior Design.** (2:2:2) F.

**621. Advanced Drawing and Painting.** (2:2:2) F. Andrus

**624. Advanced Landscape Painting.** (2:2:2) F. Turner

**625. Advanced Still Life Painting.** (2:2:2) S. Turner

**627. Pictorial Composition.** (2:2:2) F. Turner

**633. Advanced Water Color Painting.** (2:2:2) F. Turner

**639. Advanced Layout.** (2:2:2) F. Gunn

**642. Advanced Illustration.** (2:2:2) S. Gunn

**650. Advanced Relief and Intaglio Printmaking.** (2:2:2) F. Andrus

**652. Serigraphy and Color Lithography.** (2:2:2) S. Andrus

**656. Advanced Sculpture.** (2:2:2) F.

**664. Advanced Ceramics.** (2:2:2) F.S. Wilson

**666. Advanced Metal and Jewelry Design.** (2:2:2) F.S. Weaver

**668. Art Education.** (2:2:0) S. Gunn

**671. Survey of Recent Studies in Art Education.** (2:2:0) F. Gunn

**674. Advanced Portrait Painting.** (2:2:2) F. Andrus

**676. Advanced Figure Painting.** (2:2:2) S. Andrus

**680. Advanced Mural Design and Painting.** (2:2:2) F. Darais

**690. Color.** (2:2:0) F. Andrus

**692. Color.** (2:2:0) S. Prerequisite: Art 690. Andrus

**695. Seminar.** (1:1:0) F.S.

The following courses may be repeated (b and c) for credit. M.F.A. students may repeat courses (d) for credit. They are designed to offer a block of time for concentrated study toward maturity in one of the graduate art fields (1) painting and sculpture, (2) design. A Course of Study Outline must be prepared by the graduate student and his faculty adviser, and must include enough core breadth.

**568A,B,C. Art Education Studio.** (3:1:5 ea.) F.S.Su. Gunn, Weaver, Wilson

**617A,B,C,D. Practical Problems in Interior Design.** (4:4:4 ea.) Prerequisite: Art 615.

**622A,B,C,D. Advanced Figure Drawing.** (4:4:4 ea.) Arr. Prerequisite: Art. 621. Andrus

**626A,B,C,D. Advanced Painting.** (4:4:4 ea.) Arr. Prerequisite: Art 621 or 624 or 625 or 674 or 676.

**629A,B,C,D. Advanced Design.** (4:4:4 ea.) Arr. Prerequisite: Art 310. Darais

**635A,B,C,D. Advanced Water Color.** (4:4:4 ea.) Arr. Prerequisite: Art 633. Turner

**647A,B,C,D. Advanced Commercial Art.** (4:4:4 ea.) Arr. Prerequisite: Art 639 or 642. Gunn

**653A,B,C,D. Advanced Printmaking.** (4:4:4 ea.) Arr. Prerequisite: Art 650 or 652. Andrus

**658A,B,C,D. Advanced Sculpture.** (4:4:4 ea.) Arr. Prerequisite: Art 656.

**665A,B,C,D. Advanced Ceramics.** (4:4:4 ea.) Arr. Prerequisite: Art 664. Wilson

**667A,B,C,D. Advanced Crafts.** (4:4:4 ea.) Arr. Prerequisite: Art 666. Weaver

**682A,B,C,D. Advanced Mural Design and Painting.** (4:4:4 ea.) Arr. Prerequisite: Art 580 or 680. Darais

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

# Bacteriology

**Professors:** Beck, Donaldson, Larsen (chairman, 110 B), Sagers.
**Associate Professors:** Bradshaw, Hoskisson.
**Assistant Professors:** North, Trent.

### Requirements

Adequate preparation for graduate work in the Department of Bacteriology presupposes satisfactory training in the physical and biological sciences. If a student is deficient in foundation courses, opportunity will be given after entering Graduate School to correct these deficiencies; however, such a student will

not be able to receive the advanced degrees in the minimum time required of more qualified candidates. Prior to acceptance as a graduate major in the Department of Bacteriology, credit will be evaluated with particular emphasis placed on the applicant's training in qualitative, quantitative, organic and biological chemistry; mathematics; botany; zoology; and physics.

### Master's Degree

All students receiving advanced degrees in bacteriology are required to have completed the following courses or equivalents: Bact. 331, 501, 511, 531, 551; one year of inorganic college chemistry; one year of organic chemistry; one semester of quantitative analysis; one year of biochemistry; one year of college physics; and Math. 111.

### Doctor of Philosophy Degree

Prior to selection of a dissertation subject and assignment to a research adviser, the student must pass a written qualifying examination in the following areas: (a) general microbiology, (b) pathogenic microbiology, (c) immunology, (d) virology, (e) bacterial physiology, and (f) microbial genetics. This examination will normally be given after one year of graduate study, or in case the student has received the master's degree, at the beginning of work for the Ph.D. degree. After satisfactory completion of the qualifying examination, the student will be assigned a permanent advisory committee, the chairman of which will be his major research adviser.

A student must pass a comprehensive written and oral examination prior to admission to candidacy for the Ph.D. degree. This examination will be taken not earlier than two semesters after completion of the qualifying examination. Prior to admission to the comprehensive examination the student must have satisfied the language requirements and completed courses in differential and integral calculus and physical chemistry.

### Courses

**501. Pathogenic Microbiology.** (5:3:6). F.S. Prerequisite: Bact. 331 or consent of instructor. Larsen

A study of the characteristics of pathogenic bacteria, viruses, rickettsia, yeasts, and molds.

**511. Immunology.** (4:2:6) F.S. Prerequisite: Bact. 501 or consent of instructor. Donaldson

Theories of immunity; training in serological methods.

**521. *Industrial Microbiology.** (2:2:0) F. Prerequisites: Bact. 331 and biochemistry. Larsen

The employment of microorganisms in industrial processes.

**522. *Industrial Microbiology Laboratory.** (1:0:3) F. Prerequisite: completion of or concurrent registration in Bact. 521. Larsen

**531. Virology.** (2:2:0) S. Prerequisite: Bact. 501. Trent

Characteristics of viruses and virus diseases.

**532. Virology Laboratory.** (2:0:6) S. Prerequisite: completion of or concurrent registration in Bact. 531. Trent

**541. *Cultivation and Nutrition of Bacteria.** (2:0:6) F. Prerequisite: Bact. 331. R. Sagers

A laboratory study of selective enrichment techniques, fundamental nutritional requirements, and growth properties of the major taxonomic groups of bacteria.

**551. Advanced Microbiology.** (3:3:0) S. Prerequisite: Bact. 331. Beck

552. **Advanced Microbiology Laboratory.** (1-2:0:3-6) S. Prerequisite: completion of or concurrent registration in Bact. 551. Beck, Bradshaw

561. ***Radioactive Tracer Teachniques in Biology.** (2:0:6) F. Prerequisite: consent of instructor. Beck, R. Sagers

581. ***History of Bacteriology.** (1:1:0) F. Prerequisite: senior or graduate status. Larsen

611. ***Advanced Immunology.** (2:2:0) S. Prerequisite: Bact. 511. Donaldson

□Agron. 614. **Advanced Soil Microbiology.** (3:2:3). F.

631. **Advanced Virology.** (2:2:0) Prerequisites: Bact. 531, 532, Chem. 582 or equivalent. North, Trent
Repication and biophysical characteristics of cytocidal and oncogenic animal viruses with emphasis on the molecular basis for the attendant changes in cell metabolism.

632. **Cell and Tissue Culture Techniques.** (2:0:4) Prerequisites: Bact. 531 and 532, Chem. 581 and 582 or equivalent. Trent, North
A laboratory course in advanced techniques utilized in cell and tissue culture procedures.

651. **Special Topics in Bacterial Metabolism.** (2:2:0) F. Prerequisite: Bact. 552. Beck, Bradshaw, R. Sagers

661. ***Microbial Genetics.** (3:3:0) F. Prerequisites: Bact. 331, a course in general genetics, and Chem. 582 or equivalent. Bradshaw
A study of genetic processes in bacteria and viruses, with special emphasis on recombination, transduction, mutation, replication mechanisms, and related topics.

662. ***Microbial Genetics Laboratory.** (1:0:3) F. Prerequisite: completion of or concurrent registration in Bact. 661. Bradshaw

691. **Graduate Seminar.** (1:1:0) F.S.

695. **Research to Furnish Data for Thesis.** (1-10:Arr.:Arr.) F.S.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.

795. **Doctoral Candidate Research.** (Arr.) F.S.

799. **Dissertation for the Ph.D. Degree.** (Arr.) F.S.

*Offered alternate years only.

# Botany

**Professors:** Christensen, (chairman, 210 B), Harrison, McKnight, Stutz.
**Associate Professors:** Moore, Murdock, Welsh.
**Assistant Professors:** Hess, Stocks, Whitton.
**Collaborator:** Odell Julander.

### Requirements

A student working toward a graduate degree in botany should have a basic understanding of general botany, taxonomy, genetics, morphology, physiology, and ecology. It is assumed that he will also have training in mathematics, chemistry, physics, bacteriology, soils, and zoology adequate for advanced study in the area of his specialization. Where deficiencies exist provision will be made for correcting them.

An advisory examination is required of all candidates for graduate degrees. The examination is a means for evaluation of the student's preparation in the

major fields of botany. This examination should be completed by the end of the first full semester of graduate study.

### Master's Degree

The requirements for the master's degree in botany are those listed above and the general requirements of the Graduate School. The Master of Science degree is offered in botany.

### Doctor of Philosophy Degree

In addition to the general Graduate School requirements for the Doctor of Philosophy degree, students in the Department of Botany will be required to satisfy the following special requirements:

One major area of specialization within the department is required. One minor area of specialization within the department, consisting of at least 15 semester hours, and one minor sequence outside the department, consisting of at least 15 hours, are required.

Students will be required, normally, to complete a master's degree before undertaking the doctorate program.

The comprehensive examination may be taken after at least one full year of graduate study and after the language examinations have been passed. It will be an oral examination and will explore thoroughly the student's background in the major areas of botany, including basic undergraduate work.

The student will conduct original research that makes a contribution to knowledge, and present a satisfactory dissertation.

### Courses

501. **Histological Technique.** (2:0:6) F. (Offered 1967-68 and alternate years) Prerequisite: Bot. 101 or Zool. 105.
Techniques of preparing plant tissues for microscopic examination.

510. **Advanced Taxonomy.** (3:2:3) S.Su. Prerequisites: Bot. 110 and Bot. 276 or consent of instructor. (One three-day field trip to be arranged.) Welsh

515. **Agrostology: Taxonomy and Ecology of Grasses.** (2:1:5) F. (Offered 1966-67 and alternate years) Prerequisite: Bot. 110. Harrison
Classification and ecology of grasses. Important forage species are emphasized.

525. **Advanced Cytology.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: Bot. 101 or Zool. 105. Moore, Whitton

535. **Advanced Mycology.** (4:2:6) S.Su. (Offered 1967-68 and alternate years) Prerequisite: Bot. 335 or equivalent. McKnight
A detailed study of taxonomy and morphology of special groups.

539. **Paleobotany.** (3:2:3) S. (Offered 1967-68 and alternate years) Prerequisites: Bot. 101 or 105, and historical geology.

550. **Plant Geography.** (3:2:3) F. (Offered 1967-68 and alternate years) Welsh
The distribution of plant species and communities in the light of present and past climates.

557. **Experimental Ecology.** (2:0:6) S. (Offered 1966-67 and alternate years) Murdock
Investigations on the phenology of selected species.

561. **Watershed Management.** (3:2:3) S. (Offered 1966-67 and alternate years) Murdock

591. **Seminar.** (1:1:0) F.
Presentation and discussion of current topics in botany.

598. **Special Problems.** (1-3:0:3-9) F.S.

620. **Cell Biology.** (3:2:3) S. (Offered 1967-68 and alternate years) Hess

630. **Angiosperm Morphology.** (4:3:3) F. (Offered 1966-67 and alternate years) Prerequisite: Bot. 105 or 331.
A detailed study of the flowering plants with emphasis on relationships.

634. **Morphogenesis.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: familiarity with taxonomy, anatomy, and physiology or biochemistry.
The development of form in organisms, with emphasis on plants.
Moore

638. **Advanced Mycology II.** (2:1:3) F.S. (Offered 1966-67 and alternate years) Prerequisite: a laboratory course in bacteriology, botany, or zoology.
McKnight
Advanced studies of fungi with emphasis on genetics.

641. **Physiology of Fungi and Algae.** (4:3:3) S. (Offered 1966-67 and alternate years) Prerequisites: Bot. 335 and 440. Stocks

655. **Field Ecology.** (2:1:Arr.) S.Su. (Extended field trip.) Prerequisite: consent of instructor. Christensen, Murdock
Ecological field work in forests and rangelands.

676. **Cytogenetics.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisites: genetics and cytology. Stutz

678. **Organic Evolution.** (3:3:0) S. Prerequisite: genetics or consent of instructor.
Stutz

680. **Advanced Plant Pathology.** (3:2:3) S. (Offered 1966-67 and alternate years) Prerequisite: Bot. 480. Hess
A detailed study of plant diseases and their causes, with emphasis on viruses, fungal pathogens, or nematodes.

691. **Graduate Seminar.** (1:1:0) S.

697, 698 **Special Problems.** (1-3:0:3-9 ea.) F.S.Su.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

740. **Advanced Plant Physiology I.** (3:2:3) S. (Offered 1967-68 and alternate years) Prerequisite: Bot. 440. Harrison, Moore, Stocks

741. **Advanced Plant Physiology II.** (3-4:2-3:3) F. (Offered 1966-67 and alternate years) Prerequisite: Bot. 440. Harrison, Moore, Stocks

742. **Plant Nutrition and Growth.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: Bot. 440. Harrison

750. **Grassland and Desert Ecology.** (3:3:0) F. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor. Christensen, Murdock

752. **Forest Ecology.** (3:3:0) F. (Offered 1967-68 and alternate years) Prerequisite: consent of instructor. Christensen, Murdock

760. **Conservation of Natural Resources.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor.
Christensen, Moore, Murdock

776. **Population Genetics.** (3:3:0) S. (Offered 1967-68 and alternate years) Prerequisite: genetics.

795. **Research for Doctoral Degree.** (2-4:0:6-12) F.S.Su.

799. **Doctoral Dissertation.** (Arr.) F.S.Su.

# Business Education

**Associate Professors:** Bell, Croft, Polson.
**Assistant Professor:** Waters (chairman, 351 JKB).

### Admission

To be admitted to full degree-seeking status, a student must have received the baccalaureate degree with a major in business teacher education. He must also have satisfied established state requirements for a certificate to teach business subjects in the public schools.

Entrance into the program is subject to approval by a departmental graduate faculty committee. A prospective graduate major is required to obtain departmental approval of his program before registering.

### Requirements

Upon achieving degree-seeking status, the student will be assigned by the director of the department's graduate program to an advisory committee. It will be the committee's task to assist the student in identifying an appropriate program of studies leading to the master's degree.

The student will be recommended for the master's degree in business education when the following minimum requirements have been satisfied.

1. Successful completion of at least 30 hours of approved graduate study as follows:

| | |
|---|---|
| business education | 15 hours |
| minor field (must be in the College of Business) | 9 hours |
| electives (including thesis) | 6 hours |
| Total | 30 hours |

2. Presentation in final form of an acceptable research project.

3. Satisfactory defense of research project and evidence of adequate professional preparation by means of an oral examination.

### Courses

**615. Methods of Instruction in Business Education: Typewriting and Shorthand.** (3:3:0) F.Su.
A critical evaluation of classroom methods, psychology of learning, and findings of research pertaining to improvement of instruction in typewriting, shorthand, and related subjects.

**620. Methods of Instruction in Business Education: Bookkeeping and Economic Education.** (3:3:0) S.Su.
An analysis of course content, classroom methods, and teaching materials pertaining to improvement of instruction in bookkeeping and economic education.

**625. Tests and Measurements in Business Education.** (3:3:0) S.Su. Prerequisite: Stat. 221 or equivalent.
A survey of tests and measurements used in business education, and an analysis of their uses and methods of construction.

**630. Current Developments Influencing the Curriculum and Content of Business Education.** (2:2:0) S.Su.
A study of recent technological developments, such as automation in business, and an analysis of the content, materials, and procedures of business education.

**635. Analysis of Recent Research in Business Education.** (3:3:0) F.Su.
Review and analysis of recent research in business education, and evaluation of its implications for improved classroom instruction.

**640. Trends of Thought in Business Education.** (2:2:0) F.Su.
Fundamental ideas that have shaped the business curriculum in the United States and basic issues that have affected purposes, trends, and control of business education in public and private institutions.

**665. Practicum in Business Education.** (3:3:0) F.Su.
The planning and development of creative research projects in the field of business education. Experienced teachers are permitted to use actual school problems and projects.

**675, 676. Business Education Workshop.** (2:2:0 ea.) Su.
A series of clinics in selected business subjects.

**690A,B,C,D. Seminar in Business Education.** (1-2:1-2:0 ea.) Su.
An intensive clinic emphasizing one or more selected topics in business education.

**694. Independent Readings.** (1-2:1-2:0) F.S.Su.

**698. Field Project for Master's Degree.** (1-4:1-4:0) F.S.Su.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Business Management

**Professors:** Christensen, Dyer, Moffitt, Oaks, Orton, Smith, Taylor.
**Associate Professors:** Daniels, Done, Doxey, Sessions, Taylor, Wirthlin.
**Assistant Professors:** Call, Daines (director, 158 JKB), Eagar, Faerber, Rick enbach.

## MASTER OF BUSINESS ADMINISTRATION PROGRAM

The Master of Business Administration Program awards an MBA degre at the successful completion of a two-year graduate course of study. Durin this period a student will have earned 64 semester hours of graduate credit The summer months are to be used at the discretion of the candidate, althougl work in industry is encouraged.

Training knowledgeable generalists in the field of business administratior has been and will continue to be the prime objective of the program. The curriculum attempts to fulfill this major task by utilizing the following basic stems of training: (1) administration, (2) environment, (3) operations, (4) quantitative-analysis, and (5) communications.

The administrative stem embraces principles of human behavior, group dynamics, human relations theory, and business policy. Operations involves production, marketing, and finance. In the quantitative stem a candidate receives an extensive and intensive exposure to mathematics, accounting, statistics, electronic computer programming, and operations research.

In the environmental stem one is involved with micro and macro economics, business ethics, government and business, and international economics. Finally, in the communications stem a candidate considers and uses the written word in case analysis and the preparation of a major research document.

This program is demanding in terms of time and intellectual activity. The rewards are at least three: (1) a candidate is acquainted with the vocabulary of business administration; (2) he is provided with analytical tools such as mathematics, statistics, economic theory, and financial analysis; (3) he is trained to solve problems in the face of uncertainty. This last-mentioned reward is undoubtedly of greatest importance. If a candidate devoted an infinite number of years in academic preparation, there would still be much knowledge which would evade him. Consequently, it is our belief that a prospective business administrator should be skilled in the fine art of decision making for both present and future purposes.

## Courses

**602. Introductory Quantitative Anaylsis.** (3:3:0) F.
Techniques of mathematics with special emphasis on applications to business situations.

**604. Management Control I.** (3:3:0) F.
Accounting as a tool for management; coordination of departmental operations; and control of assets.

**606. Interpersonal Competence and Organizational Effectiveness.** (3:3:0) F.
A training laboratory experience devoted to the stimulation and support of administrative learning and change.

**608. Management Computer Concepts.** (2:3:0) F.
The development of electronic computer concepts and programming with a focus on the role of a computer in a business firm.

**610. Micro Economics.** (3:3:0) F.
Analysis of the decision-making behavior of consumers and firms in a market economy.

**612. Marketing Management.** (2:3:0) F.
Imaginative problem-solving in marketing management with the aid of business cases and readings.

**614. Management Control II.** (3:3:0) S.
Accounting as a means of coordinating the operations of a business firm with market conditions.

**616. Production Concepts.** (2:3:0) S.
Cases and readings on current production processes and problems.

**618. Financial Management.** (2:3:0) S.
Development of the subject of finance from the point of view of the business manager. Emphasizes the use of financial statements and develops techniques and concepts for analysis of liquidity, profitability, and financial planning.

**620. Quantitative Analysis in Executive Decision Making.** (3:3:0) S.
The use of probability and statistical inference in risk situations. The focus is on business problems.

**624. Macro Economics.** (3:3:0) S.
Analysis of the measurement, level, and rate of growth of national income.

**626. Written Analysis I.** (3:3:0) S.
Written analysis of the characteristics of an administrative viewpoint.

**651. Systems Analysis and Design.** (3:3:0) F.
Analyzing the problems of planning, controlling, and improving systems.

**653. Business Policy I.** (3:3:0) F.
A top-management approach to the problems of determining corporate strategy.

**655. Advanced Mathematical Analysis for Business Decisions.** (3:3:0) F.
A study of quantitative decision models under certainty, risk, and uncertainty.

**657. Advanced Financial Management.** (2:3:0) F.
Analytical approach to such financial management concepts as capital budgeting and present value, valuation, reorganization, dividend policy, stock-holder relationships, money and capital markets, and long-range financial planning.

**659. Problems of Marketing Strategy.** (2:3:0) F.
A strategic approach to product planning, pricing, consumer profiles, and market development.

**661. Written Analysis II.** (3:3:0) F.
The preparation of a major topical research report drawn from first-hand industrial observation.

**663. Business Policy II.** (3:3:0) S.
A top-management approach to the problem of implementing corporate strategy.

**665. Human Relations.** (2:3:0) S.
Concepts of human relations theory with particular emphasis on group and intergroup conflict and collaboration.

**667. Management of Financial Institutions.** (2:3:0) S.
Review and analysis of the structure of our overall financial system to develop understanding of the primary forces which affect this system. Consideration of the major financial management problems of principal financial institutions.

**669. Investments.** (2:3:0) S.
The principles and practice of investment, with special attention to investment analysis, elements of the investment process and markets, and criteria for investment decision. Problems of both individual and institutional investors will be considered.

**671. Written Analysis III.** (2:3:0) S.
An analytical critique and presentation of a major topical research report.

**673. The Business Administrator and Government Policy.** (2:3:0) S.
The impact of governmental policies and practices on a business administrator.

**675. International Business Management.** (3:3:0) S.
Business decision making in other countries with emphasis on financial reporting, personnel practices, production processes, and marketing channels.

**677. Business, Society, and the Individual.** (2:3:0) S.
Ethical concepts in business administration and the influence of business upon the individual and the total social environment.

## Chemical Engineering Science

**Professors:** Barker, Christensen, Pope (chairman, 176 ELB).
**Assistant Professors:** Clark, Hanks, Horton.

The Chemical Engineering Science Department offers the Master of Science degree with research in such fields as mass transfer, solvent extraction, fluid dynamics, heat transfer, thermodynamics, process control, applied mathematics, high pressure, and materials.

### Requirements

A student working toward a graduate degree in chemical engineering science should have completed a bachelor's degree or its equivalent from an accredited engineering school. Students without such training are required to complete basic chemical engineering science courses before proceeding with a graduate program.

In addition to the general Graduate School entrance requirements, a student may be required to successfully complete a departmental entrance examination before he is accepted as a candidate for the master's degree.

The student should normally choose a research project prior to or at the beginning of his first semester of residence at the University.

The three-year master's program is designed to allow a student to obtain a Master of Science degree one year following his Bachelor of Engineering Science degree. A student may enter this program upon the completion of the first two years of the chemical engineering curriculum listed in the undergraduate catalog. The student's name will be placed in the graduate department's file and he will be assigned an advisory committee from the graduate faculty of the Chemical Engineering Science Department. Formal admission to the Graduate School will take place at the end of the course work shown for the fourth year and will be contingent on meeting the requirements of the Graduate School.

The suggested curriculum for each of the three years follows (for undergraduate course description see the General Catalog):

**Junior Year**

| | F | S |
|---|---|---|
| Ch.E. 374, 376 | 3 | 3 |
| Ch.E. 375, 377 | 1 | 1 |
| Ch.E. 378 | | 3 |
| Math. 322 | 3 | |
| Chem. 461, 462 | 3 | 5 |
| Dev. Assy. | ½ | ½ |
| E.E. 300 | | 1 |
| Engl. 216 | 2 | |
| Rest. Elec. | 3 | |
| C.E. 301, 304, or Physics | 3 | 3 |
| | 18½ | 18½ |

**Senior Year**

| | F | S |
|---|---|---|
| Ch.E. 476 | 3 | |
| Ch.E. 474 | 3 | |
| Ch.E. 447 | 1 | |
| Ch.E. 478 | 3 | |
| Ch.E. 479 | | 3 |
| Ch.E. 464 | | 3 |
| Ch.E. 699 | 1 | 2 |
| Grad. Ch.E. or Grad. minor | | 3 |
| Dev. Assy. | ½ | ½ |
| E.E. 301, 302 | 2 | 2 |
| Physics 315 | 3 | |
| Soc. Sci. Hum. | 2 | 3 |
| | 18½ | 16½ |

**Fifth Year (a) (b)**

| | F | S |
|---|---|---|
| Ch.E. 673 | 3 | |
| Ch.E. 685 | 2 | |
| Ch.E. 674 | 3 | |
| Ch.E. 699 | 1 | 2 |
| Ch.E. 675 | | 2 |
| Ch.E. 677 | | 2 |
| Ch.E. 681 | | 3 |
| Minor | 3 | 6 |
| | 12 | 15 |

(a) One of the following courses will have been taken in the Spring Semester of the fourth year.

(b) Students with one-half time teaching assistantships may take only 9 hours per semester.

## Courses

**671. Advanced Heat Transfer.** (2:2:0) F. Barker, Christensen, Pope
An advanced treatment of the transfer of heat.

**672. Advanced Fluid Flow.** (2:2:0) F. Hanks, Pope
An advanced treatment of the flow of fluids.

**673. Advanced Transport Phenomena.** (3:3:0) F. Baker, Hanks
Derivation of general differential equations of conservation of mass, heat, and momentum. Theory and method of estimating transport coefficients. Applications of general conservation equations to various transport phenomena.

**674. Advanced Thermodynamics.** (3:3:0) F. Christensen, Clark, Horton
Advanced applications of thermodynamics to chemical engineering problems. Estimation and correlation of thermodynamics properties; chemical equilibra and introduction to statistical and irreversible thermodynamics.

675. **Separation Process.** (2:2:0) S. Clark, Hanks, Pope
Absorption and extraction, interphase mass transfer, multicomponent systems, simultaneous absorption and chemical reaction, and design of equipment.

677. **Creative Skills in Chemical Engineering.** (2:2:0) S. Christensen, Horton, Pope
Application of creativity and prior course work to the solution of open-end problems currently being encountered in the frontiers of chemical engineering. Introduction to critical path scheduling and operations research.

681. **Kinetics and Catalysis.** (3:3:0) S. Christensen, Horton, Pope
Application of fundamental theories of reaction kinetics, diffusion, and absorption to reacting systems.

682. **Nuclear Engineering.** (2:2:0) Arr. Barker
Reactor design including reactor physics, heat transfer, engineering materials, instrumentation, and control.

683. **Advanced Plant Design.** (2:2:0) Arr. Pope
Comprehensive design of a chemical plant including feasibility and market surveys, economic evaluation, raw materials, plant layout, design instrumentation, materials of construction.

684. **Advanced Process Dynamics and Control.** (2:2:0) Arr. Barker
Dynamics of chemical processes, the measurement of process variables, and the control of processes using feed-back control.

685. **Chemical Engineering Analysis.** (2:2:0) F. Hanks
Mathematical analysis of selected topics in chemical engineering processes with emphasis on obtaining solutions of practical value.

686. **Distillation.** (2:2:0) Arr. Pope
Binary and multicomponent distillation, prediction of equilibrium relationships, extractive and azeotropic distillation, application of computers to complex distillation column design; instrumentation.

687. **Chemical Engineering Economics.** (2:2:0) Arr. Christensen, Pope
An investigation of the basic economic principles which govern the operations of chemical industry.

688. **Special Problems.** (Arr.)
Investigation of problems of special interest in the field of chemical engineering.

691. **Seminar.** (0:1:0) F.S.
Discussion of advanced topics including the plans and results of the master's thesis.

697. **Research.** (Arr.) F.S.Su.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Chemistry

**Professors:** Anderson, Blackham, Broadbent, Bryner, Butler, Goates (chairman, 225 ESC), Gubler, Hall, Izatt, Nelson, Swensen.
**Associate Professors:** Hawkins, Ott, Peterson, Snow, White.
**Assistant Professors:** Bills, Cluff, Mangum, Hawkes, Paul, Wilson.

The objectives of the department in the selection and training of candidates for advanced degrees are first, to assure adequate depth and breadth of knowledge; and second, to discover and develop ability to do independent and

productive scientific research. The student's record in undergraduate courses will be accepted as partial evidence of the breadth of his knowledge. He will be expected to extend and broaden this knowledge by taking or auditing advanced courses selected with the approval of his advisory committee.

A graduate student in chemistry is expected to meet all the general requirements for an advanced degree as outlined by the Graduate School. Special requirements of the Chemistry Department are given below.

During his first semester of graduate work the student should choose an advisory committee whose function will be to guide him throughout his graduate study. The chairman of the committee is chosen by the student and the department chairman after the student has consulted with at least five members of the Chemistry Department. The remaining members of the advisory committee are chosen by the student and the committee chairman.

The Chemistry Department relies upon its graduate students for many assignments in laboratory and recitation instruction. Unless a student is excused by the faculty, he will be expected to teach a cumulative total of at least two semesters at 20 hours a week during his residency toward the doctor's degree, half of which must come after his first year in residency. Master's degree candidates are expected to teach half this amount.

### Master's Degree

In addition to the general Graduate School requirements, a student must successfully complete a departmental entrance examination before he will be accepted for the Master of Science degree in chemistry. Each candidate for the master's degree will be required to pass a reading test or present a year's college credit in French, German, or Russian.

The department offers the three-year master's degree program (MA-3), wherein the student wishing to prepare for high school or junior college teaching may obtain the Master of Arts degree in chemistry. This program will normally begin at the end of the student's sophomore year. Details may be obtained from the chairman of the Chemistry Department.

### Doctor of Philosophy Degree

Requirements for a Doctor of Philosophy degree in a field of chemistry include satisfactory completion of the following:

1. A written appraisal examination to determine if the student is adequately prepared to enter immediately upon his graduate program.
2. A major consisting of the following courses required of all students: Chemistry 503, 504, and 601 plus an additional 11 hours minimum chosen from the major area by the student and his advisory committee.
3. A first minor in basic chemistry consisting of three of the following basic courses not in the student's major area: Chemistry 514, 581, 521, 551 or 552, 561.
4. A second minor consisting of course work and study satisfactory to the student's advisory committee, both in quality and quantity.
5. A petition to continue graduate study will be submitted by the student before the end of the semester in which the 16th hour of graduate credit is obtained. An evaluation by the chemistry faculty of the student's academic performance will then be made. It will then be recommended that he (1) be allowed to proceed with his Ph.D. program and to apply subsequent classwork and research toward the requirements for this degree, (2) be allowed to enroll in a master's program, or (3) be denied permission to remain enrolled as a degree-seeking student in the Department of Chemistry.
6. A comprehensive examination consisting of written examinations in the major and minor fields and an oral proposition examination. The comprehensive examination may not be taken before the student's academic performance has been evaluated (Item 5), but must be taken at least one year prior to the granting of the degree. All parts of the comprehensive examination must be completed within a period of three weeks.

7. Admission to candidacy after (1) completing two years of graduate study, (2) passing language examination, (3) passing comprehensive examination, and (4) obtaining approval of subject for dissertation.
8. A dissertation prepared under the direction of the candidate's advisory committee in which he reports and interprets the results of his research.
9. A final oral examination devoted primarily to the dissertation.

**Courses**

503. **Research Laboratory Techniques.** (1:0:3) F.

504. **Instrumental Analysis.** (2:1:3) F.S. Prerequisite: Chem. 461.

514. **Inorganic Chemistry.** (3:3:0) S.

518. **Inorganic Syntheses.** (2:0:6) S. (Offered 1967-68 and alternate years)

521. **Analytical Chemistry.** (2:2:0) F. Prerequisites: Chem. 462 and 465.

522. **Analytical Chemistry Laboratory.** (2:0:6) F. Prerequisite: concurrent registration in Chem. 521.

524. **Quantitative Microanalysis.** (2:1:3) S. (Offered 1966-67 and alternate years)

551. **Systematic Identification of Organic Compounds.** (2-3:1:3-6) F.

552. **Advanced Organic Chemistry.** (3:3:0) S.

561, 562. **Chemical Thermodynamics.** (3:3:0) F. (2:2:0) S. Prerequisite: Chem. 462.

564. **Nuclear and Radiochemistry.** (3:2:2:) S. (Offered 1967-68 and alternate years)

581, 582. **Biochemistry.** (3:3:0 ea.) F.S. Prerequisite: Chem. 352.

584, 585. **Biochemistry Laboratory.** (2:0:6 ea.) F.S. Prerequisite: completion of or concurrent registration in Chem. 581, 582 respectively.

594A,B,C,D,E,F,G,H. **General Seminar.** (1-2:1:0 ea.) Required of all senior and graduate students in chemistry every semester in residence.

598. **Special Problems.** (Arr.) Arr. Registration by permission.

600. **Directed Teaching in Chemistry.** (1:1:0) F.S.

601. **Geometry of Atoms and Molecules.** (3:3:0) F.

611. **Chemistry of the Main Group Elements.** (3:3:0) S. (Offered 1966-67 and alternate years)

612. **Chemistry of Transitional Elements.** (3:3:0) S. (Offered 1966-67 and alternate years)

658. **Organic Syntheses.** (3:1:6) F.

663. **Reaction Kinetics.** (2:2:0) F. (Offered 1967-68 and alternate years)

681. **Biochemistry of Lipids.** (2:2:0) F. (Offered 1966-67 and alternate years)

682. **Biochemistry of Nucleic Acids.** (2:2:0) F. (Offered 1966-67 and alternate years)

683. **Biochemistry of Carbohydrates.** (2:2:0) S. (Offered 1966-67 and alternate years)

684. **Biochemistry of Proteins.** (2:2:0) S. (Offered 1967-68 and alternate years)

697. **Master's Candidate Research.** (Arr.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**719. Selected Topics in Inorganic Chemistry.** (1-3:1-3:0) Arr.

**725. Electro-Analytical Chemistry.** (3:3:0) F. (Offered 1966-67 and alternate years)

**729. Selected Topics in Analytical Chemistry.** (1-3:1-3:0) Arr.

**751. Mechanisms of Organic Reactions.** (3:3:0) F.

**757. Chemistry of Natural Products.** (3:3:0) S. (Offered 1967-68 and alternate years)

**758. Heterocyclic Compounds.** (3:3:0) S. (Offered 1966-67 and alternate years)

**759. Selected Topics in Organic Chemistry.** (1-3:1-3:0) Arr.

**761, 762. Statistical Mechanics.** (3:3:0 ea.) F.S. (Offered 1966-67 and alternate years)

**765, 766. Quantum Chemistry.** (3:3:0 ea.) F.S. (Offered 1967-68 and alternate years)

**769. Selected Topics in Physical Chemistry.** (1-3:1-3:0) Arr.

**781. Enzyme Chemistry.** (2:2:0) F. (Offered 1967-68 and alternate years)

**782. Mannalian Biochemistry.** (2:2:0) S. (Offered 1967-68 and alternate years)

**789. Selected Topics in Biochemistry.** (3:3:0) Arr.

**797. Doctoral Candidate Research.** (Arr.)

**799. Dissertation for the Ph.D. Degree.** (Arr.)

## Child Development and Family Relationships

**Professors:** Cannon, Knowles, Moss, Porter.
**Associate Professor:** Rollins.
**Assistant Professor:** Laws (chairman, 1239 SFLC).

### Fields

The Master of Science degee is offered in two fields: child development and family relationships. The Doctor of Philosophy degree is offered in three fields: child development, family relationships, and marriage and family counseling.

### Requirements

It is the responsibility of the student to meet all the general requirements for advanced degrees outlined by the Graduate School. In addition, there is a minimum number of background courses required of each major student which he would normally take in his undergraduate preparation in the department. These include: CDFR 410, 460, 422 or 322, and a course in statistics. Students who choose to emphasize child development must have a course in personality development, such as Psych. 450, and those who emphasize family relationships must have a course in sociological theory, such as Sociol. 403. The advisory committee will assist the student in planning his graduate program and may at their discretion suggest additional courses to enable the student to have an adequate background for graduate work. This advisory committee must include two members of the department graduate faculty. The committee chairman is selected in consultation with the professor in charge of the department graduate program.

### Master's Degree

(For general requirements see Graduate School regulations)

The student may choose to meet the major and minor requirements as described under Option I or Option II in the Graduate School regulations. The advisory committee will plan the exact program with the student. Additional requirements include a thesis prepared under the direction of the student's advisory committee in which he interprets and reports the results of his research work; the satisfactory performance in the final oral examination which will evaluate the student's competence in his major and minor fields and his ability to defend his thesis.

### Doctor of Philosophy Degree

(For general requirements see Graduate School regulations)

The student shall be accepted as a degree-seeking candidate when he has successfully completed one semester of graduate work (12-15 hours) in the department and has taken an evaluation examination administered by the department. This evaluation is given after the completion of one year of graduate work. The results are used in determining the student's qualifications to continue graduate studies and to help plan his program.

The student is expected to develop competence in one field of specialization. A comprehensive oral and written examination will be given toward the end of his program which covers four areas (including his field of specialization): child development, family relationships, research methodology and statistics, and counseling theory and practice. The minor field will also be included as part of the examination. At the conclusion of his program, the student will present and defend his dissertation which represents the results of his original research before a committee formally appointed by the Graduate School.

The selection of the student's minor field or fields shall be determined in consultation with his advisory committee.

### Courses

510. **Growth, Development and Behavior: Conception to Adolescence.** (2:2:0) F. Prerequisites: CDFR 210, 410. Knowles
An intensive study of principles of growth, development and behavior.

511. **Growth, Development and Behavior: Adolescence to Adulthood.** (2:2:0) S. Prerequisite: CDFR 510. Knowles
Intensive survey of human development and behavior through adolescence and adulthood.

520. **Workshop in Child Development.** (2:2:0) Su. Prerequisite: 8 hours CDFR or permission of department chairman.
Intensive study of application of principles of child development and child guidance.

560. **Workshop in Family Relationships.** (2:8 hrs./day for 2 weeks:0) Su. Prerequisite: 8 hours in CDFR or consent of department chairman.
Intensive study of application of principles of child development and family relationships.

566. **Materials and Procedures in Family Life Education.** (2:2:0) Su. Moss
An evaluation of materials, resources, and procedures in teaching family life education in the high school.

570. **Community and Professional Responsibilities to Children and Families.** (2:2:0) F.S. Prerequisites: CDFR 210, 361. (Sociology 111 recommended.) Moss
Acquaintance with resources of the community as they relate to the welfare of children and families. A consideration of the responsibilities of professional persons working with children and families.

575. **Parent Education.** (2:2:0) S. Prerequisite: consent of instructor.
Basic principles in organization of parent study programs. Formulation and presentation of programs for parents.

580. **Introduction to Marriage and Family Counseling.** (2:2:0) S. Prerequisite: consent of instructor. Laws
Theories and techniques used in marriage and family counseling. Consideration of individual and group counseling as it pertains to the family.

590. **Readings in Child Development and Family Relationships.** (1-2:1-2:0) F.S.Su. Prerequisite: consent of instructor.
Discussions and reports of current readings in this field. Open to students who have completed fifteen hours of child development and family relationships.

595. **Special Topics in Child Development and Family Relationships.** (1-2:1-2:0) F.S.Su.
Individual study for qualified students majoring in child development and family relationships upon consultation with the instructor and the chairman of the department.

596. **Research Problems and Methods in Child Development and Family Relationships.** (2:2:0) S. Cannon
Analysis of research methods used in human development and family relationships. Students have active experience in formulating a research project.

611. **Current Concepts in Research in Child Development.** (2:2:0) S. Rollins

616. **Measurement Techniques in Child Development.** (2:2:1)

660. **Family Patterns and Individual Development.** (2:2:0) S. Prerequisite: CDFR 460. Porter, Rollins

661. **Dynamics of Family Interaction.** (2:2:0) S. Prerequisite: CDFR 360. Cannon, Porter, Rollins

663. **Critical Problems in Family Life.** (2:2:0) F. Prerequisite: CDFR 360. Cannon, Porter

664. **Current Concepts and Research in Family Relationships.** (2:2:0) F. Rollins

667. **Problems of Teaching Marriage and Family Relationships in College.** (2:2:0) S. Cannon, Laws

685. **Developmental Use of Play Experiences.** (2:2:0) S. Prerequisite: consent of instructor.

692, 693. **Seminar.** (2:2:0 ea.) F.S.

697. **Independent Research.** (1-3:1-3:0) F.S.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

760. **Concepts and Theories of Marriage and the Family.** (3:3:0) F. Prerequisites: CDFR 664 and consent of instructor. Cannon, Moss

780. **Marriage and Family Counseling.** (2:2:0) F. Prerequisites: CDFR 580; Grad. Ed. 646; consent of instructor. Laws

781. **Case Analysis in Marriage Counseling.** (2:2:0) S. Prerequisite: CDFR 780. Laws

785, 786. **Practicum in Marriage Counseling.** (3:1:6 ea.) F.S. Prerequisites: CDFR 780 and 781. Laws

792. **Seminar in Marriage Counseling.** (2:2:0) S. Laws

794. **Special Topics in Child Development.** (1-2:1-2:0) F.S.Su.

795. **Special Topics in Family Relationships.** (1-2:1-2:0) F.S.Su.

797. **Doctoral Candidate Research.** (2-4:2-4:0) F.S.Su.

799. **Dissertation for the Ph.D. Degree.** (Arr.) F.S.Su.

# Civil Engineering Science

**Professors:** Barton (chairman, 196 ELB), Enke, Firmage, Fuhriman, Rollins.
**Associate Professors:** Christiansen, Karren.
**Assistant Professor:** Budge.

The Department of Civil Engineering Science offers programs leading to the Master of Science degree in the areas of solid mechanics and materials, soil mechanics and foundation engineering, structural mechanics and structural engineering, highway and transportation engineering, and water resources and sanitary engineering.

A student working toward the graduate degree in civil engineering should have completed a bachelor's degree or its equivalent in civil engineering. Students without such training are required to complete basic civil engineering courses before proceeding with a graduate program. The master's degree may be earned in one additional year of study beyond the bachelor's degree. A student must formally apply for admission to the Graduate School to study for the M.S. degree. Elsewhere in this catalog details may be found regarding the Graduate School requirements.

All students working toward a graduate degree in civil engineering are expected to complete a minimum of 6 semester hours of mathematics credit above the level of ordinary differential equations. Such courses may be a part of the master's degree program if they were not completed in the undergraduate program. A nonthesis program may be petitioned for, which, if granted, increases the total hours required to a minimum of 32. The M.S. degree which includes a thesis normally requires a minimum of 30 credit hours. The graduate student is required to register for a graduate seminar, C.E. 691, each semester that he is a full-time student. A minimum of one credit hour is required. This ½ credit hour per semester is not counted as part of the 30 or 32 minimum credit hours total.

In addition to the general Graduate School requirements, a student may be required to successfully complete a departmental entrance examination before he is accepted as a candidate for the Master of Science degree. It should also be pointed out that a written comprehensive final examination may be required in addition to the oral examination which is required of all students before graduation. A notice in writing will be furnished the student if he is required to take this written examination.

## Courses

501. **Advanced Mechanics of Materials I.** (3:3:0) (Interdepartmental) Arr. Prerequisite: C.E. 303.
Introduction to theories of elasticity, plasticity, and strain energy methods; stresses and strains in beams, curved members, rotating discs, thick cylinders, torsion and structural members.

502. **Advanced Properties of Materials I.** (3:3:0) (Interdepartmental) Arr. Prerequisite: 305 or equivalent.
Modern concepts of mechanics as applied to the behavior of engineering materials under various loading conditions and use including static, creep, fatigue and impact; stress concentrations; temperature and other environmental conditions; state of stress and internal structure; dislocation theory; tests and interpretation of test data.

503. **Applied Elasticity.** (3:3:0) Arr. Prerequisite: C.E. 303; Math. 331.
Analysis of stress and strain in two dimensions; equation of equilibrium and compatibility; problems in elasticity; emphasis on applications to machine and structural design.

507. **Experimental Stress Anaylsis I.** (3:2:3) Arr. Prerequisite: C.E. 303.
Principles and techniques of the experimental methods of stress determination and their application to static engineering problems; includes mechanical and optical gages, and brittle lacquers; emphasizes electric

strain gages, calibration and instrumentation; introduces photoelasticity and photostress techniques.

527. **Stiffness and Flexibility Methods in Structures.** (3:3:0) F.S. Prerequisite: C.E. 422.
Application of matrix algebra, development of the stiffness and flexibility matrices and the application of these methods to statically determinate and indeterminate articulated frame and arch structures. Use is made of the digital computer.

531. **Water Resources Engineering.** (3:2:3) Arr. Prerequisites: C.E. 431 and 432.
Planning and basic design of hydroelectric flood control, irrigation, and multi-purpose projects involving the utilization of water resources; consideration of hydraulic and hydrologic design elements.

542. **Foundation Engineering.** (3:2:3) Arr. Prerequisite: C.E. 341.
Subsurface exploration, bearing capacity concepts, settlement of structures, and basic principles of foundation design.

543. **Physico-Chemical Characteristics of Soils.** (3:3:0) Arr. Prerequisites: Chem. 106, C.E. 441.
Physico-chemical relationships in soils, including the structures of the clay, minerals, properties of the electrical double layer, ion exchange phenomena, and equilibra.

551. **Sanitary Engineering.** (3:2:3) F. Prerequisites: C.E. 432, Bact. 381.
Reviewing of public health engineering. Applications to design, construction, and operation of water supply and sewerage system.

571. **Engineering Ethics, Economics, and Legal Problems.** (3:3:0) S.
Professional, legal, and economic problems of the engineering profession, including contracts, specification writing, and ethics. Case histories are studied as they affect the engineering profession.

602. **Advanced Properties of Materials II.** (3:3:0) Arr. Prerequisite: C.E. 502 or equivalent.
Topics selected from the following: analysis of stress and finite strains, theories of the mechanism of flow and fracture, theory of dislocation, creep, viscosity, visco-elastic behavior, non-Newtonian flow, theories of static and dynamic fatigue, thermo cycling, and fretting corrosion.

603. **Theory of Elasticity.** (3:3:0) Arr. Prerequisites: Math 321 and 322 or equivalent.
The mathematical theory of elasticity, analysis of stress and strain, generalized Hooke's law, uniqueness theorem, and special topics in elasticity.

615. **Structural Dynamics.** (3:3:0) S. Prerequisites: C.E. 304 and 422 or equivalent.
Matrix formulation of the free and forced, damped and undamped, lumped parameter, multiple degree-of-freedom, linear system. Approximate methods for nonlinear damped systems. Applications to elastic forced response of steel frameworks and beams subject to moving loads. Elasto-plastic analysis of multistory buildings, earthquake analysis and design.

620. **Advanced Structures—Theory and Design.** (3:3:0) F.S. Prerequisites: C.E. 423, 424, 527.
Advanced topics in structural theory and design arches, continuous structures on elastic supports, plastic design theory, articulated space structures.

621. **Thin Shell Structures.** (3:3:0) Arr. Prerequisites: C.E. 422, 424.
Theory and design methods related to domes, arches, solid plate, and hyper structures.

622. **Design of Bridge Structures.** (3:2:3) F. Prerequisites: C.E. 341, 422, 423, 424.
Design of bridge structures; floor systems, composite and continuous beams and girders, trusses, piers, and abutments.

623. **Advanced Concrete Design.** ((3:3:0) S. Prerequisites: C.E. 422, 424.
Basic theory of prestressed concrete, pre- and post-tensioning methods, details of design and fabrication, applications to continuous structures. Yield line theory for reinforced concrete slabs. Design of folded plate structures.

625. **Design of Multistory Structures.** (3:2:3) S. Prerequisites: C. E. 341, 422, 423, 424, 620 or consent of instructor.
Building code design criteria; dead and live loads; dynamic response to seismic and wind forces; shear wall theory and design. Analysis and design of floors, columns, frames, walls, and foundations using elastic and plastic methods.

632. **Advanced Hydrology.** (3:3:0) Arr. Prerequisites: C.E. 431, 432 or equivalent.
Theory application of advanced hydrologic principles to engineering design and investigations.

633. **Hydraulic Design of Water Control Structures.** (3:3:0) Arr. Prerequisite: C.E. 423.
Hydraulic and structural design of dams and appurtenant works and other water control structures.

641. **Advanced Soil Mechanics.**(3:3:0) Arr. Prerequisites: C.E. 341, 542 or equivalent.
Advanced topics in soil mechanics including stress distribution in earth masses, the shearing strength of soils, consolidation theory, settlement analysis, stability of slopes, and the bearing capacity of soils.

642. **Advanced Soil Mechanics Laboratory.** (2:0:6) Arr. Prerequisites: C.E. 341, 542, 641 or equivalent.
Advanced study in the technique of laboratory investigations of soils.

643. **Earth and Rock Fill Structures.** (3:3:0) Arr. Prerequisite: C.E. 341 or equivalent.
Aspects associated with the design and construction of earth and rock-fill dams including geological study and erection of damsites, location and selection of materials, seepage and pore pressure studies, interpretation and application of shearing strength data, stability analysis and the construction controls.

644. **Advanced Foundation Engineering.** (3:3:0) Arr. Prerequisite: C.E. 641.
An applied course in foundation engineering including techniques of subsurface investigation, determination of the allowable soil pressures for footings and the design of spread footings, raft foundation, and pile foundation for structures on clays, silts, and sand.

645. **Structural Foundations.** (3:3:0) Arr. Prerequisites: C.E. 422 and 542 or equivalent.
An applied course in the structural design of foundations with special emphasis on pertinent aspects of soil mechanics. Foundation types will include spread footings, combined footings, raft foundations, retaining structures, driven piles, drilled piles, caissons and cofferdams.

652. **Design of Water Treatment Works.** (3:3:0) Arr. Prerequisites: C.E. 551 or equivalent.
Application of principles of hydraulics, chemistry, and bacteriology in engineering analysis and design of water treatment units including mixing, flocculation, sedimentation, sterilization, and water softening.

653. **Design of Sewage Treatment Works.** (3:3:0) Arr. Prerequisite: C.E. 551 or equivalent.
Application of principles of hydraulics, chemistry and bacteriology in engineering analysis and design of sewage treatment units including removal, sedimentation, flotation, filtration, activated sludge, sludge digestion, and dewatering facilities.

**654. Industrial Waste Treatment.** (3:3:0) Arr. Prerequisite: C.E. 551 or equivalent.
Studies of basic industries and operations and waste treatment problems associated with them. Problems of treatment unit design for various types of industries.

**661. Traffic Engineering-Theory of Flow and Geometric Design.** (3:3:0) F. Prerequisite: C.E. 461 or equivalent.
Analysis of the basic characteristics of motor-vehicle traffic. The theory of traffic flow. Freeway operations and traffic regulations. Design of highways and parking facilities, including freeways and expressways, arterials, at-grade intersections, interchanges, channelizations, parking lots and garages.

**663. Pavement Design.** (3:3:0) S. Prerequisite: C.E. 461 or equivalent.
Properties of pavement components, including soils, stabilized soil, base, subbase, subgrade, and bituminous materials. Design of rigid and flexible pavements. Pavement evaluation and strengthening. Materials selection and evaluation.

**691A,B,C,D. Civil Engineering Graduate Seminar.** (½:1:0 ea.) F.S.

**694. Selected Problems in Civil Engineering.** (2:2:0) Arr.

**697. Research in Civil Engineering.** (2:Arr.:Arr.) F.S.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.

# Communications

**Professors:** Bradley, Smith (chairman, F-557 HFAC).
**Associate Professor:** Rich.

The Department of Communications offers an integrated program of graduate studies embracing courses offered prior to 1963-64 in the separate fields of journalism and radio-television. The program's objectives are to prepare qualified students for responsible and creative leadership as mass communication specialists or as teachers in the field. It emphasizes general studies which have common application to a number of professional specializations, including newspaper and magazine editing and publishing, commercial radio and television, educational radio and television, advertising, public relations, and communications research.

The program seeks to maintain the student's communicative skills and techniques, but the acquisition of these will normally be a matter for the student's preparation at the undergraduate level.

## Admission

Applicants holding a bachelor's degree will be considered for admission to the program regardless of the undergraduate major, subject to the following requirements:

1. Evidence of a satisfactory level of ability in written and spoken English. A grade of "B" or above in Communications 211 or comparable studies will be considered suitable evidence of such ability.
2. Adequate undergraduate background in communications, normally including a minimum of 14 semester hours in the following courses or equivalents: introduction to mass communication, news reporting, communication law, and history of mass communication.
3. Adequate undergraduate background in the humanities and social sciences, including a minimum of 25 semester hours in five or more of the

following areas: anthropology, economics, English, geography, history, languages, political science, psychology, sociology, and statistics.

4. Competence in a chosen specialization in communication, attained through undergraduate course work or experience. (Professional experience completed by an applicant will be evaluated with relation to possible equivalents among the foregoing requirements.)

### Degree Requirements

The department offers studies leading to the Master of Arts degree in the field of communications. Candidates may elect programs of study under either Option I (major and minor) or Option II (major and supporting areas). A preliminary examination, thesis, and final oral examination are required of all candidates.

Students desiring to complete a graduate minor in communications should consult the chairman of the department regarding a recommended program of study.

### Courses

**340. Radio and Television News.** (2:1:3) S. Prerequisite: Commun. 211, 255. Recommended: Commun. 312, 372. Bradley
News preparation and production of newscasts and public affairs programs. Consideration of interviews, documentaries, commentaries, editorials, and special events. Practical and lab experience provided.

**371. Introduction to the Motion Picture.** (2:2:1) F.Su. Prerequisite: Physics 177 or equivalent.
Introduction to documentary film theory, using films to illustrate technique and content. Overview of communication aspect of the cinema.

**427. Magazine Article Writing.** (2:2:0) F. Prerequisite: Commun. 211 or consent of instructor.
Planning and writing nonfiction articles for sale to periodicals. Analysis of magazine markets, and criticism of articles written in the course.

**439. Advertising Media and Campaigns.** (3:3:0) F.S. Prerequisites: Commun. 330, and 331 or 333. Wolsey
Research and planning of advertising campaigns as related to national and local objectives; media selection and budgeting; individual project in production of an advertising campaign.

**449. Radio and Television Programs and Audiences.** (2:2:0) F.Su. Prerequisite: Commun. 346. Rich
Observation and analysis of basic program forms used in radio and television; examination of effective program structure and appeals; consideration of audience situation and measurement.

**456. Television Directing Workship.** (2:1:3) S. Prerequisite: Commun. 346. Recommended: Dram. Arts 460. Rich
Theories and techniques of television directing.

**458. Radio Directing Workshop.** (2:1:3) F. Prerequisite: Commun. 346.
Theories and techniques of radio directing.

**480. History and Problems of Mass Communication.** (4:4:0) F.S.
Development of American press, film, and broadcast media from colonial beginnings to present; analysis of contemporary practices and problems of the mass media as social and business institutions.

**510. Mass Media Administration.** (2:2:0) S. Prerequisites: Commun. 312, or 439, or 449. Rich
Problems of organization and administration for newspapers, magazines, radio stations, and television stations.

**520. Editorial Writing and Interpreting of Public Affairs.** (3:2:3) S. Prerequisite: Commun. 312 or consent of instructor.
Study of the opinion and interpretative functions of the mass media of communication. Assignments in editorial writing and depth reporting.

**526. School Yearbook Production.** (2:2:0) Su. (Offered 1966-67 and alternate years)
Planning and supervising production of school yearbooks, including copy, illustration, layout, printing, binding, and business management.

**528. Magazine Editing and Publishing.** (2:2:0) S. Prerequisite: Commun. 312.
Principles of layout and design for magazines and business publications. Contemporary practices in content and production.

**535. Public Relations.** (3:3:0) F.S.Su. Home Study also. Prerequisite: Commun. 211 or consent of instructor. Bradley, Smith
Philosophy and practice of public relations in business, governmental, educational, and other institutions. Study of publics, media, methods, press relations, and publicity.

**536. Public Relations Case Studies.** (2:2:0) S. Prerequisite: Commun. 435. Bradley
Case studies in public relations. Cases are selected from a wide range of actual public relations problems which have confronted business, governmental, educational, and service institutions.

**550. Problems and Practices in Educational Television and Radio.** (2:2:0) S.Su. Prerequisites: advanced standing in communications or graduate education. Rich
A study of current problems and practices in the utilization and administration of television and radio in education and other noncommercial applications.

☐**Business Mgt. 555. Problems in Advertising.** (3:3:0) Arr.

**580. World Communication Channels.** (2:2:0) F. Burnett
Mass communication media in principal areas of the world; problems of international communication and barriers to the flow of information between peoples.

**610. Studies in Communication Theory.** (3:3:0) F. Recommended: one or more courses in philosophy, psychology, and sociology. Rich
A study of the historical and philosophical development of communications theory with special application to problems of the mass media.

**611. Research Methods in Mass Communications.** (2:2:0) F.Su. Prerequisites: Stat. 221, or Grad. Ed. 552, or Psych. 370, or Sociol. 524. Smith
Research techniques in communication fields, including readership, readability, content analysis, and audience measurement. Introduction to thesis writing.

**612. Mass Communication and Society.** (3:3:0) S.Su. Rich
Concepts of mass communication in contemporary society; critical evaluation of responsibilities and performance of the mass media of press, radio, television, and film.

**615. Propaganda, Public Opinion and Communications.** (2:2:0) S. Smith
Roles of the mass media as channels of propaganda and influences upon public opinion. Effects of public opinion on mass communication.

**630. Advertising Planning and Research.** (2:2:0) S. (Offered 1966-67 and alternate years) Prerequisite: Commun. 439.
An analysis of methods employed to measure the effectiveness of advertising, with emphasis on pretesting techniques for advertising campaigns.

**690. Seminar in Mass Communication.** (1:1:0) F.S.Su.

691, 692. **Special Studies in Communication.** (1-3:Arr.:Arr. ea.) F.S.Su.
Individual work on approved problems not leading to a thesis. Projects must be approved before registration.

694. **Readings in Mass Communications.** (1-2:Arr.:Arr.) F.S.Su. Prerequisite: consent of instructor.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Dramatic Arts

**Professors:** Hansen, Gledhill, Mitchell, Woodbury (chairman, D581 HFAC).
**Associate Professor:** Metten.

### Fields

Dramatic arts and theatre, and interpretation

### Requirements

For full graduate standing as a major in dramatic arts and theatre, or interpretation, the student must present as background Dram. Arts 121, 123, Speech 101, or their equivalents, plus 14 hours of electives approved by the chairman of the department. Academic programs are available leading to the M.A. degree.

During the first semester of graduate study, candidates for the master's degree must pass a written test to demonstrate proficiency in background in the area in which they elect to major.

It is expected that graduate students will acquaint themselves with all the general regulations for advanced degrees as outlined by the Graduate School.

The requirements for the master's degree may be completed under Plan A (requiring a thesis) or under Plan B (other work substituted for the thesis).

Candidates for the nonthesis degree are required to complete 24 graduate semester hours in the major, 12 graduate semester hours in the minor, and four graduate semester hours in electives, for a total of 40 semester hours. The following courses are required in the 40-hour total: Dram. Arts 564, 565, 643.

The candidate must successfully complete a written comprehensive examination near the close of his course work. The written examination will cover the following areas: playwriting, design for the stage, lighting, costume design, technical production, theatre-business-management, acting, directing, theatre history, dramatic literature, and dramatic theory and criticism.

Under the direction of the chairman of the special committee, the candidate must complete a scholarly paper or monograph outside the regular class research.

A detailed list of requirements may be obtained from the office of the chairman of the department.

Following are divisions of courses in dramatic arts:

**Dramatic arts and theatre:** 555, 564, 565, 571, 572, 573, 577, 578, 643, 667, 668, 670, 671, 672, 673, 674, 675, 676, 678, 697, 699.

**Interpretation:** 423, 643, 660, 661, 662, 663, 667, 696, 699.

**Speech:** 527.

### Courses

555. **Theatre Workshop.** (2-4:2-4:2) Su. only. May be repeated. Hansen
Practical production on the graduate level.

564. **Theatre History I.** (3:3:0) F. Hansen
The development of the theatre, covering Primitive, Egyptian, Greek, Roman, Medieval, and Elizabethan periods.

**565. Theatre History II.** (3:3:0) S. Metten
The development of the theatre, covering the Restoration Period in England, the Western theatre in the 19th and 20th centuries, and the Oriental theatre.

**572, 573. Children's Theatre.** (2:2:1 ea.) F. Golightly, Mitchell
Directing for audiences of children and youth. Participation in Youtheatre productions. Attendance at Monday night Mask Club recommended.

**577, 578. Playwriting.** (1-2:1-2:0 ea.) F.S.
Advanced techniques and theories.

**643. Methods and Problems of Research in Speech and Dramatic Arts.** (2:2:0) F. Metten, Woodbury
Required of all graduate students. Should be taken as early as possible.

**660. Theory of Interpretation** (2:2:0) S. Gledhill, Metten

**661. Oral Interpretation of Classical Literature.** (2:2:0) F.S. Metten, Woodbury

**662. Regional Dialects.** (2:2:0) Arr. Clinger

**663. Program Building and Lecture Recital.** (2:2:0) Arr. Gledhill, Metten, Woodbury

**667. History of Acting.** (2:2:0) S. Hansen, Woodbury
Styles and theories from Classical to Method.

**668. Special Problems in Theatre History.** (1-3:1-3:0) F.S.
Oriental theatre and the Free theatres of Europe.

**670. Advanced Play Production—Technical.** (2:2:0) S. Henson
A formal study of the "isms" from the point of view of stage design.

**671. Experimental Theatre.** (2:2:0) F. Hansen

**672. Problems of the Producing Director.** (2:2:0) F. Hansen

**673. Advanced Play Production—Directing.** (2:2:0) S. Hansen, Metten, Woodbury

**674. Projects in Theatre.** (1-4:1-4:0) F.S. Hansen, Metten, Woodbury

**675, 676. Stage Design.** (2:2:1 ea.) F.S. May be repeated. Henson

**678. Stage Lighting.** (1-2:1-2:0) F.S. Struthers

**696. Seminar in Interpretation.** (1-3:1-3:0) F.S. Gledhill, Metten

**697. Seminar in Arena Theatre.** (1-4:1-4:0) F.S. Hansen, Woodbury

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

# Economics

**Professors:** H. R. Clark, Davies, Nelson.
**Associate Professors:** Wirthlin, W. Clark (chairman, 302A JKB), Doxey.
**Assistant Professors:** Wimmer, Rickenbach.

For full graduate standing a student in economics must have completed Econ. 111, 112, either 411 or 412 and Stat. 221 or their equivalents. If either 411 or 412 have not been completed, that course must be a part of the graduate program. Econ. 471 must be a part of the graduate program if it was not taken as an undergraduate course.

The student must submit his scores on the graduate record examination to the Department of Economics before consideration can be given to his applica-

tion for admission to the master's program. His major field of interest on the graduate record examination must be designated "economics."

There are two basic programs in economics:

1. General economics—the student in this program may select 15 hours of work under the guidance of his committee. This program must include Econ. 611, 612, 615, and 691. In the event the student has had Econ. 274 in his undergraduate work, course 691 may be waived.

2. Junior college teaching of economics—those preparing to teach economics in the junior colleges should acquire either a junior college or a secondary teaching certificate. The junior college certificate requires the completion of Grad. Ed. 640, 642, and 644. The major work, consisting of 15 hours, should be selected to add breadth of understanding of economic principles and institutions and must include Econ. 691 (unless 274 was taken as an undergraduate) and the following courses: Econ. 611, 612 and 615. Depending upon the graduate's background and interest, the minor will usually be selected from one of the following fields: accounting, business management, geography, political science, psychology, or statistics.

Students in both programs must complete an acceptable thesis in addition to the 15 hours of graduate classwork in economics. They should also register for Engl. 99 (noncredit course) and Econ. 696 (1 sem. hr.) during their first semester of graduate work.

*□**Geography 522. Urban Geography.** (2:2:0) F.

*□**Agricultural Economics 525. Production Economics.** (2:2:0) S.

*□**Geography 533. Industrial Geography.** (3:3:0) S.

**535. Economic Problems of Asia.** (3:3:0) S.

*□**Agricultural Economics 580. Advanced Agricultural Policy.** (2:2:0) S.

**590. Advanced Economic Problems.** (1-2:Arr.:Arr.) F.S.Su.
Prerequisites: Econ. 111 and 112, or equivalent.

**601. Workshop on Economic Education.** (3:Arr.:Arr.) Su. (Continuous for three weeks.)

**611. Advanced Theory of Income, Employment and the Price Level.** (3:3:0) F. (m) Prerequisite: Econ. 411. Wirthlin
An advanced course in the theory of income and employment. Considerable emphasis will be placed on the most recent advances made in this area of study. Journal articles will be extensively used.

**612. Advanced Price Theory.** (3:3:0) S. (m) Prerequisite: Econ. 412 Wirthlin
An advanced course in price theory which will use recent journal articles as a frame of reference for discussion periods.

**615. Advanced History of Economic Thought.** (3:3:0) S. (m) Prerequisite: Econ. 415 or consent of instructor. Davies
An advanced course in the development and evolution of the theoretical and institutional tools of economic analysis.

**617. Contemporary Economic Thought.** (2:2:0) S. (m)

**630. Advanced Economic Development.** (3:3:0) S. (m) Wirthlin

**658. International Trade and Finance.** (3:3:0) F. (m) Doxey

**675. Advanced Government Finance.** (3:3:0) S. (m) Wimmer

**682. Business and Economic Fluctuation.** (2:2:0) S. (m) Nelson

**688. Econometrics.** (2:2:0) S. (m) Prerequisites: Econ. 389 or Math 112, or equivalent; Stat. 221 and Econ. 312.
An advanced course in econometrics in which the use of calculus, matrix algebra, etc. is employed to analyze the quantifiable theorums of economic theory.

**689. Advanced Mathematical Economics.** (3:3:0) S. (m) Prerequisites: Econ. 311 and 312, Stat. 221, Math. 112 or equivalent, or consent of instructor.
A graduate course in a study of the application of mathematical tools to the quantifiable elements of economic theory.

**691. Seminar in Economic History.** (2:2:0) S. (m) Doxey

**692. Seminar in Monetary and Fiscal Policy.** (2:2:0) F. Prerequisite: Econ. 311. Wimmer

**693. Seminar in Comparative Economics Systems.** (2:2:0) S. (m) Nelson

**694. Seminar in Labor Economics and Labor Relations.** (2:2:0) S. (m) Davies

**696, 697. Research.** (Arr.) F.S.Su.

**699. Thesis for Master's Degree.** (6-9: Arr.:Arr.)

*These courses cannot be used for a graduate minor in economics.

## Electrical Engineering Science

**Professor:** Jonsson (graduate adviser, 173 ELB).
**Associate Professors:** Berrett, Clegg, Humpherys, Losee (chairman, 175 ELB), Monson, Woodbury.

The Department of Electrical Engineering Science offers the master's degree in the areas of electronics and solid state, communications, computers, acoustics, electromagnetic fields, network synthesis, and automatic control. All students working toward a graduate degree in electrical engineering are expected to:

1. Fulfill the general requirements of the Graduate School.
2. Complete a minimum of 15 semester hours in the major field exclusive of thesis.
3. Take E.E. 513, Linear Systems.
4. Complete a minimum of 6 hours in mathematics.
5. Take a minimum of 6 hours of E.E. 699, wherein the student must do an initial literature study and present his findings at a faculty-student seminar prior to the start of his graduate research.

The student should normally choose a major professor and with him determine an advisory committee prior to or at the beginning of his first semester of residence at the University. Either Option I or II is available to the student.

In view of the engineering science emphasis given to the undergraduate curriculum, the transfer student may find it necessary and desirable to take certain courses normally required of the undergraduate student at Brigham Young University. Prospective majors should consult the department prior to registration to determine if such a course will be considered remedial or allowed to apply toward the degree.

### Courses

**411. Feedback Concepts.** (2:2:0) F. Prerequisites: C.E. 302 or 304, Math 323, and either (a) E.E. 432 and E.E. 442 or (b) E.E. 302 and 304. Jonsson
Consideration of basic feedback concepts as applied to engineering systems. Root-locus, log magnitude, and phase criteria are presented as useful tools for analysis and design.

**450. Electrical Properties of Materials.** (2:2:0) S. Prerequisite: E.E. 442.
Electrical properties of crystalline solids.

**460, 461. Electromagnetics.** (3:3:0 ea.) F.S. Prerequisite: Math. 323.
Classical static and dynamic electricity and magnetism; Maxwell's equations and their applications in electromagnetic engineering; antennas.

**462. Communication Circuits.** (3:3:0) F. Prerequisites: E.E. 541, concurrent registration in E.E. 467.
Circuits and systems used in radio, television, and radar including microwave hardware and network theory.

**467. Communications Laboratory.** (2:0:6) F. Prerequisite: concurrent registration in E.E. 462.
Devoted to building and testing circuits studied and designed in E.E. 462.

**511, 512. Network Synthesis.** (3:3:0 ea.) F.S. Prerequisites: E.E. 312, 442.
Humpherys
Approaches to the design of 2-terminal and 4-terminal networks. Means of meeting insertion loss and phase shift requirements are discussed.

**513. Linear Systems.** (3:3:0) F. Prerequisite: graduate standing or consent of instructor.
State-space and transform techniques in the analysis of linear systems.

**516. Servomechanisms.** (3:3:0) Arr. Prerequisite: E.E. 411. Jonsson
Application of design principles, carrier systems, component description and specification, multiloop problems including signal-flow graphs and synthesis.

**517. Digital and Sampled-data Control Systems.** (3:3:0) S. Prerequisite: E.E. 411. Jonsson
Basic theory and techniques for the analysis and design of digital and sampled-data control systems and related problems based on the Z-transform method.

**523. Digital Computer Design.** (3:3:0) F. Prequisite: E.E. 292.
The operation and logical design of digital computers.

**528. Analog Computer Design.** (2:2:0) Arr. Prerequisite: E.E. 304 or 442.
Jonsson
Theory and operation of summing, integrating, and differentiating circuits; function generators and operational amplifiers and their applications to analog computers.

**531. Electric Power Systems I.** (2:2:0) Arr. Prerequisite: E.E. 432.
The analysis and design of electrical power distribution systems and a study of electrical power distribution system protection.

**532. Electric Power Systems II.** (3:3:0) Arr. Prerequisite: E.E. 531.
Characteristics of electric power system components, additional fault study considerations, introduction to power system stability, d-c transmission.

**537. Advanced Control Machinery Laboratory.** (1:0:3) Arr. Prerequisite: E.E. 411.
This course constitutes a block of experiments in the area of machinery control systems, machinery characteristics, and power distribution methods.

**541. Switching, Timing, and Pulse Circuits.** (4:3:3) S. Prerequisite: E.E. 442.
Passive and active circuits utilizing tubes, transistors, diodes, and other devices.

**542. Advanced Switching, Timing and Pulse Circuits.** (3:3:0) F. Prerequisite: E.E. 541.
Consideration is given to switching, memory, shaping and generating circuits employing non-linear, lumped parameters.

550. **Solid State Electricity.** (4:4:0) F. Prerequisites: Ch.E. 378, Physics 315, Math. 323, E. E. 541.
Physical properties of crystalline solids, lattice vibration and energy dielectrics, conduction, band theory, semiconductors, emission, magnetism, resonance, and relaxation phenomenon.

562, 563. **Advanced Communications Theory.** (3:3:0 ea.) F.S. Prerequisite: E.E. 462.
Transmission through electric networks, periodic sampling, pulse modulation, analysis of information—transmission systems and noise considerations.

567. **Advanced Communications and Electronics Laboratory.** (1:0:3) S. Prerequisite: E.E. 462.
This course constitutes a block of experiments in the area of U.H.F. techniques, electronic circuits, communication systems, pulse forming networks, transmission lines, and filters.

570. **Illumination.** (2:2:0) Arr. Prerequisites: E.E. 312, 441. Monson
Principles and design of artificial illumination for various applications; lamp characteristics; measurements; costs.

580. **Elements of Acoustics.** (2:2:0) Arr. Prerequisite: E.E. 312. Monson
Fundamentals of sound production, transmission, and reception with an introduction into sound application in public address and other engineering systems.

581. **Psycho-Acoustics.** (5:5:0) Arr. Prerequisite: E.E. 442.
Speech and hearing from a communication engineering viewpoint. Synamical analysis of speech and hearing processes are developed. Known experimental facts about speech and hearing are systematically studied and compared with calculated results. Methods of calculating and measuring articulation index of talker-listener pair when using any specified type of communication system.

584, 585. **Advanced Musical Acoustics.** (2:2:0 ea.) Arr. Prerequisite: Physics 561, 562 or E.E. 580. Monson
Technical study of acoustical behavior of different musical instruments; consideration of sound power output to single instruments and ensembles; stereophonic reproduction of music; possibilities of electronic musical instruments.

587. **Architectural Acoustics.** (3:3:0) Arr. Prerequisite: Physics 561, 562 or E.E. 580. Monson
Fundamental behavior of sound in rooms; effects of shape and size on perception of speech and music; proper use of public address and sound reinforcing systems, sound absorption and insulation properties of different kinds of room walls; kind and amounts of sound absorption materials to use in sound treatment of rooms and auditoriums.

591, 592. **Seminar and Field Trips.** (1:0:3 ea.) F.S. Prerequisite: fifth year standing in electrical engineering.
Student and faculty presentation of special topics and subjects of curricular interest; visits to industries displaying varied types of electrical engineering applications. Participation on the annual field trip is required.

598A,B,C,D. **Special Problems and Topics.** (1-2:Arr.:Arr.) F.S.
Registration by permission of professor sponsoring problem.

618. **Nonlinear Analysis.** (3:3:0) F. Prerequisite: E.E. 411. Jonsson
Consideration of nonlinear differential equations, problems of discrete systems, design in the phase plane, adaptive control systems, dynamic programming.

619. **Nondeterministic Control Systems** (3:3:0) S. Prerequisite: E.E. 411. Jonsson
Statistical design principles, decision theory, competitive situation, queuing systems and linear programming as applied to control systems.

623. **Advanced Digital Computers.** (3:3:0) S. Prerequisite: E.E. 523.
Advanced theory and operation of digital computers and their design and application to engineering, scientific, and control problems.

645. 646. **Microwave Devices.** (3:3:0 ea). F.S. Prerequisite: E.E. 461. Berrett
Consideration is given to electron beam and solid state devices which operate at microwave frequencies.

661, 662. **Advanced Electromagnetic Fields.** (3:3:0 ea.) F.S. Prerequisite: E.E. 461. Berrett
A study of the methods of solution of electromagnetic field problems including wave propagation, waveguides, cavities, slow wave structures, plasmas, antennas and field-related devices.

697. **Master's Candidate Research.** (1-4:Arr.:Arr.) Arr.
Research not related to the master's thesis.

698. **Readings and Seminar.** (1:1:0) Arr. Prerequisite: graduate standing.
Presentation of literature studies or research results by the graduate student or faculty. Unrelated to the master's thesis.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) Prerequisite: graduate standing.
This course is intended to include all work related to the master's thesis, i.e., literature study, research, and writing. It is expected that every graduate student will make a literature study and report the results of such readings, outlining his proposed problem at a seminar with other graduate students and faculty before commencing his research and thesis.

# English

**Professors:** Britsch, Cheney, Christensen (emeritus), B. Clark, M. Clark, Farnsworth, Hart, Jacobs, Larson, Spears, Thomson, West (chairman, 357 McK), Young.
**Associate Professors:** Brady, Ellsworth, Gassman, Tanner (emeritus), Wood,
**Assistant Professors:** Cox, J. B. Harris, Madsen, J. Thomas.

For qualified students seeking the M.A. degree in English, attractive scholarships, fellowships, and part-time teaching assistantships are available. Inquiries regarding these should be addressed to the chairman of the English Department.

A graduate student may major in either English or American literature; he may minor in a subject outside the English Department, such as linguistics, or in English literature, American literature, comparative literature, or English language. In addition, he should complete the University requirements for the Master of Arts degree, which is the only graduate degree offered in the English Department. He should have reading proficiency in at least one foreign language, preferably French or German.

Among the thirty hours required for a Master of Arts degree, each student must take the following courses:

| | Hours |
|---|---|
| A. Engl. 615. Bibliography and Methods of Research | 2 |
| B. Engl. 624. Old English | 3 |

The following courses should also be included if the student did not have them as an undergraduate:

| | |
|---|---|
| A. Engl. 421. The History of the English Language | 3 |
| B. Engl. 450. or 650. Literary Criticism | 3 |

In fulfilling the thesis requirement for a master's degree in English, a student may select any one of the following three options:

(1) One long thesis on a topic demanding research, criticism, or both;
(2) Three long papers written in three different areas of English or American language or literature and on topics demanding research, criticism, or both;
(3) Two long papers written in two different areas of English or American language or literature and on topics demanding research, criticism, or both; and one long paper in the area of imaginative writing.

The work done under any of the above three options is under the direction of the student's advisory committee and must fulfill all of the requirements of form, date of submission, and binding that apply to a regular master's thesis.

The department stipulates that two hours of "B" grade or better in the series of Engl. 318, 319 or 528, or the equivalent directed experience in writing. be regarded as prerequisite for application to use imaginative writing as part of option (3) listed above. With this application, the student must forward to the graduate committee in English samples of his best writing in order that the committee may determine whether he is qualified to use imaginative writing as part of his thesis requirement.

## Courses

**500-509. Eminent American Writers.** (1:1:0 ea.) F.S.Su.
Different writers are treated each year in this series.

**510-519. Eminent English Writers.** (1-2:1-2:0 ea.) F.S.Su.
Different writers are treated each year in this series except that Milton, numbered 512, is taught once every year.

**528A,B,C,D. Advanced Creative Writing.** (2:2:0) F.S. Prerequisite: Engl. 318 or 319 or consent of instructor.
A seminar in the writing of fiction, poetry, drama, and the essay; individual consideration of manuscripts; professional orientation. May be repeated for credit with the permission of the instructor.

**529. Structure of American English.** (3:3:0) F.Su. Cox
Application of the methods of linguistic science to the description of the phonology, morphology, and syntax of American English.

**572. European Literature of the Renaissance.** (3:3:0) F. Evans, Spears
A comparative study of continental European literature of the Renaissance in its relations to English literature.

**573. European Literature of the 17th and 18th Centuries.** (3:3:0) S. (Not offered 1967-68) Evans, Spears
A comparative study of continental European literature of the 17th and 18th centuries in its relations to English literature.

**574. European Literature from 1760 to 1850.** (3:3:0) F. (Not offered 1966-67) Farnsworth, Spears
A comparative study of the romantic movements in England, Germany, France, Spain and Italy.

**575. European Literature from 1832 to 1914.** (3:3:0) S. (Not offered 1966-67) Farnsworth, Spears
Comparative study of English, German, French, Spanish, and Russian literature of this period, including naturalism, realism, and symbolism.

**582. Extended Readings in Shakespeare.** (3:3:0) F. Young
Extensive study of the body of Shakespeare's works.

**615. Bibliography and Methods of Research.** (2:2:0) F.S.Su. Gassman, J. Thomas
The use of library resources as tools for literary study and an introduction to various areas in which literary research may be pursued.

621. **Problems in the English Language.** (3:3:0) F.Su. Prerequisite: Engl. 421. Cox, McKendrick
The study of a particular period in the English language or a particular aspect of the language, such as the study of morphology or syntax.

624. **Old English.** (3:3:0) F.S.Su. McKendrick, Young
A study of Old English grammar and vocabulary in order to understand traditional syntactical patterns and to read various types of Old English prose and poetry.

625. **Beowulf.** (2:2:0) S. (Offered alternate years. Not offered 1967) Prerequisite: Engl. 624. McKendrick, Young
A close reading of the poem in the original with emphasis upon literary and cultural values.

626. **Middle English.** (2:2:0) S. (Not offered 1967. Scheduled alternately with Engl. 671) McKendrick
A detailed study of the principal Middle English dialects as illustrated in the literature of the period.

631. **The English Novel.** (3:3:0) F.Su. Prerequisite: English 332 or 333, or consent of instructor. Brady, B. Clark
An intensive analysis of literary values and techniques in selected novels. Not a survey course.

635. **The American Novel.** (3:3:0) S.Su. M. Clark, Jacobs
Various approaches to the novel with emphasis on the formal. Focus may vary according to the instructor and the needs of students.

641. **The English Drama.** (3:3:0) S. 1967, Su. 1968 Craig
A short intensive survey of English drama from its beginning, followed by independent research.

650. **Literary Criticism.** (3:3:0) F.Su. M. Clark, Hart
An examination of modern critical theory and practice and application by students to specific literary works. Prerequisite: Engl. 251, 450, or consent of instructor.

661. **Colonialism and Puritanism in American Literature.** (3:3:0) S.Su. Prerequisite: Engl. 361 or consent of instructor. Jacobs, Thomson
Intensive readings in major writers of the emerging American literary and cultural traditions before 1800.

662. **Romanticism in American Literature.** (3:3:0) F.Su. Prerequisite: Engl. 361 or consent of instructor. Jacobs, R. Thomas, Thomson
The rise and fruition of the romantic movement in American literature from Freneau to Lowell

664. **Realism and Naturalism in American Literature.** (3:3:0) F.Su. Prerequisite: Engl. 362 or consent of instructor. M. Clark, Jacobs
Dominant cultural and aesthetic trends since the Civil War.

669. **Teaching English in the Secondary Schools.** 2:2:0) F.Su. Prerequisite: Engl. 377 or consent of instructor. West
Intensive consideration of literature, writing, grammar, and reading materials appropriate to English courses and the effective use of these materials.

671. **The Medieval Period in English Literature.** (2:2:0) S.Su. Scheduled alternately with Engl. 626. Recommended: Engl. 626. McKendrick
A close reading in the original of a principal work, such as **Troilus** and **Criseyde, Piers Plowman,** or **Sir Gawain and the Green Knight,** with emphasis upon its relation to the other literature, the culture, and the history of the period.

672. **The Renaissance in English Literature.** (3:3:0) F.Su. Prerequisite: Engl. 372 or consent of instructor. Larson, J. Thomas, Wood, Young
Research in individual authors, styles, influences, and trends. Emphasis will vary according to instructor.

673. **Classicism in English Literature.** (3:3:0) S.Su. Prerequisite: Engl. 373 or consent of instructor. Gassman, Hart
A study in depth of selected writers from the period 1660-1780.

674. **Romanticism in English Literature.** (3:3:0) F.Su. Prerequisite: Engl. 374 or consent of instructor. Cheney, B. Clark, J. B. Harris
An intensive review of the major figures and trends in the Romantic period (1780-1832) along with individual research.

675. **The Victorian Age in English Literature.** (3:3:0) S.Su. Prerequisite: Engl. 375 or consent of instructor. Brady, B. Clark, Farnsworth
A careful and detailed analysis of literary genres, values, and techniques in representative works of the period. Not a survey course.

680. **Seminar in Modern Literature.** (3:3:0) F.Su. Prerequisite: at least one course in twentieth-century literature or consent of instructor.
M. Clark, Hart, Larson
Study of specific trends in literature and criticism; students may select areas of interest.

682. **Seminar in Shakespeare.** (3:3:0) F.Su. (Offered alternately with Engl. 641, "The English Drama.") Prerequisite: Engl. 382, 582, or consent of instructor. Hart
Problems in Shakespearean scholarship and criticism.

691. **Research in Folklore.** (2:2:0) S. (Offered alternate years) Spring 1966
Cheney
Directed study and research in folklore and folkways with emphasis on Mormon heritage and tradition.

695. **Individual Readings in English.** (1-2:1-4:0) F.S.Su.
Intended for investigation beyond course work offered, not for filling out minimum required hours.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
See options described with master's program in English above.

# Food and Nutrition

**Professors:** Bennion (chairman, 2218 SFLC), Morris.

### Requirements

The department offers work leading to the Master of Science degree in food and nutrition. For full graduate standing a student must have completed a bachelor's degree with a major in food and nutrition or a closely related field, with basic courses in the physical and biological sciences. Students with subject matter deficiencies may be recommended for admission, but these deficiencies must be removed before a degree is granted.

The specific selection of courses for a graduate degree is based upon the student's objectives and interest and is planned in consultation with the major professor. The emphasis in the thesis problem may be in the area of food science or in nutrition. However, all candidates for a master's degree in food and nutrition must have completed the following: Food and Nutrition 635, 636, 664, 666, 690, 691, and 695; Chemistry 581 and 582. A thesis is required.

### Courses

594. **Special Problems in Food.** (1-2:0:3-6) F.S. Prerequisite: permission of instructor and chairman of department.
Designed for students who have completed at least 12 hours in food and nutrition. Independent study of a special problem in food under the direction of an instructor.

595. **Special Problems in Nutrition.** (1-2:0:3-6) F.S. Prerequisite: permission of instructor and chairman of department.
Designed for students who have completed at least 12 hours in food and nutrition. Independent study of a special problem in nutrition under the direction of an instructor.

635. **Advanced Human Nutrition I.** (3:3:0) F. (Offered 1967 and alternate years) Prerequisite: Food and Nutrition 335 or equivalent. Morris
Protein and amino acid nutrition; carbohydrate, lipid, and energy metabolism.

636. **Advanced Human Nutrition II.** (3:3:0) S. (Offered 1968 and alternate years) Prerequisite: Food and Nutrition 335 or equivalent. Morris
Mineral and vitamin metabolism.

664. **Science and Experimental Foods I.** (3:3:0) F. (Offered 1966 and alternate years) Prerequisite: Food and Nutrition 464 or equivalent. Bennion
Protein foods; simple collodial systems, gels, emulsions, and foams.

666. **Science and Experimental Foods II.** (3:3:0) S. (Offered 1967 and alternate years) Prerequisite: Food and Nutrition 464 or equivalent. Bennion
Enzymes in food; carbohydrate and lipid food materials.

690. **Seminar in Food.** (1-2:1-2:0) F. Bennion

691. **Seminar in Nutrition.** (1-2:1-2:0) S. Morris

695. **Methods of Research in Food and Nutrition.** (3:0:9) F. (Offered 1966 and alternate years)

697. **Research.** (1-3:Arr.:Arr.) F.S.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Geography

**Associate Professors:** Layton, Millett (chairman, 167-D, HGB).
**Asistant Professors:** Grey, Tuttle.

### Requirements

The department offers work leading to the Master of Science degree. Candidates for the degree will be admitted on a provisional basis until completion of an oral examination demonstrating a sound knowledge of subject matter as covered in the undergraduate degree in geography. Students must also be prepared to present evidence of their ability to complete written assignments if they have not previously completed such work as undergraduates within the department. Deficiencies in any area must be removed either by additional class work, or by individual study, as determined in consultation with the faculty of the department. Admission on a degree-seeking basis will be made only after completion of this examination and arrangement of any needed remedial work.

Degree-seeking students are allowed a wide range of choice in individual projects and supporting classes according to their particular interest. All such classes must be approved, however, by the major and minor professors in consultation with the student at the beginning of his work. All candidates must include Geography 601, 620, 698, and 699 within their program.

## Courses

501. **Principles of Geography.** (3:3:0) S. Tuttle
Designed to present information required for the teaching of geography.

504. **Geographic Field Techniques.** (2:1:2) S. Millett
For majors only.

522. **Urban Geography.** (2:2:0) F. (m) Aamodt, Layton
Distribution of urban areas, their development, internal land use patterns, and functions in the world's economy.

533. **Industrial Geography.** (3:3:0) S. Prerequisite: Geog. 231. Layton
A systematic analysis of location patterns of major industries in the United States; raw materials, power resources, and other factors in industrial location.

552. **United States.** (2:2:0) S. Prerequisite: Geog. 351. Tuttle
A concentrated study of various phases of the geography of the U. S. Considerable research and reporting by individual students is required.

553. **Geography of Utah.** (2:2:0) S.
The distribution of climates, landforms, vegetation, agriculture, mining, manufacturing, and service industries as related to present population and future growth patterns in Utah.

556. **South America.** (2:2:0) S. Prerequisite: Geog. 455 Layton

557. **Caribbean Area.** (2:2:0) Prerequisite: Geog. 455. Layton

561. **Western Europe and the Mediterranean.** (2:2:0) Prerequisite: Geog. 460. Millett
A comprehensive study of the systematic and regional geography of non-Communist Europe.

562. **USSR and Its Satellites.** (2:2:0) Prerequisite: Geog. 460 or 470 or consent of instructor. Tuttle
A concentrated study of the physical features, resources, agriculture, industries, and distribution of peoples.

571. **Problems of Asia.** (2:2:0) F. Prerequisite: Geog. 470. Horiuchi
A comprehensive study of the systematic and regional geography of Asia.

580. **Geography of Underdeveloped Areas.** (2:2:0) F. Prerequisite: consent of instructor. Aamodt, Horiuchi
Physical, economic, and human geography as it affects the world's underdeveloped areas, with emphasis on future development possibilities.

☐**History 585. Historical Geography of the U.S.** (2:2:0) Layton

598. **Seminar in Techniques of Research and Presentation.** (2:2:0) Arr.
A pro-seminar concentrating on the scholarly use of the printed and manuscript materials in the different aspects of geography and the effective presentation of research findings in written and oral form.

601. **Physical Geography.** (2:1:2) F. Millett

620. **Cultural Geography.** (2:1:2) S. Aamodt

690. **Readings in Systematic Geography.** (1:0:2) F.S.
For graduate students only.

691. **Readings in Regional Geography.** (1:0:2) F.S.
For graduate students only

695. **Special Problems.** (1-2:1-2:0) F.S.

**696, 697. Research.** (2:2:0 ea.) F.S.

**698. Graduate Seminar.** (2:2:0) Arr.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.

# Geology

**Professors:** Hintze (chairman, 275 ESC), Bissell, Bullock, Hansen, Rigby.
**Associate Professors:** Bushman, Hamblin, Phillips.
**Assistant Professors:** Best, Braithwaite, Brimhall.

### Fields

Economic geology;
mineralogy and petrology;
paleontology;
stratigraphy and sedimentation;
structural, field, and dynamic geology

### Requirements

The following courses, or their equivalents from another university, are prerequisite for all geology students working toward an advanced degree in geology: Geol. 111, 112, 251, 252, 311, 312, 313, 460, 470, and 480. A summer field camp, Geol. 410, or its equivalent at another institution, is a necessary prerequisite.

The entering graduate student will be expected to have completed substantially the same background course requirements in mathematics, chemistry, physics, biology, and languages, as are required of Brigham Young University undergraduate geology majors. Arrangements to make up any undergraduate deficiencies will be made in consultation with the Geology Department chairman during the first registration of students entering on their graduate work.

The Department of Geology offers training for the master's degree and the degree of Doctor of Philosophy, with specialization in various fields of geology. The graduate student is urged to acquire a broad undergraduate foundation in geology and supporting fields before he concentrates on a chosen branch of the subject. To this end certain fundamental course work is required as listed above. Graduate course offerings in geologic specialties are sufficiently varied and complete in order that all students may select courses according to their needs and inclinations as determined in consultation with their advisers.

It is expected that graduate students will meet all the general requirements for advanced degrees as outlined by the Graduate School. The responsibility of meeting these requirements rests with the student.

The graduate program of the Department of Geology offers instruction in five broad divisions of geology, with the following course offerings in each division: (1) economic geology—Geol. 507, 510, 512, 520, 530, 535, 540, 545, 551, 552, 561, 562, 563, and 646; (2) mineralogy and petrology—Geol. 507, 510, 512, 540, 545, 551, 552, 561, 562, 563, 653, 655, 656, 657, 671, and 672; (3) paleontology—Geol. 507, 510, 512, 540, 551, 574,, 575, 576, 577, 580, 581, 582, 583, 680, 682, and 685; (4) stratigraphy and sedimentation—Geol. 507 510, 511, 512, 540, 551, 574, 575, 576, 577, 583, 653, 670, 671, 672, and 678; (5) structural, field and dynamic geology—Geol. 507, 510, 511, 512, 530, 540, 551, 610, 615, 657, 670, 671, 672, and 678.

A student may select any one of the five fields for a major. He may elect one or two of the remaining fields for his minor(s). Geol. 507, 512, 551, and 591A, B, C, and D are required of all graduate students. Geol. 696, 698, 699, and 799 are variable credit courses commensurate with work completed in each of these areas.

### Master's Degree

(For general requirements see Graduate School regulations.) Requirements for a master's degree in geology include: (1) at least fifteen hours of formal course work in the major field and at least nine hours of formal course work in one or two minor fields; (2) a written exploratory examination at the beginning of the graduate program; (3) a comprehensive oral examination on the graduate course work prior to his thesis defense; (4) a thesis embodying the results of research under a faculty member's supervision for a total of six credit hours, and (5) a final oral examination on the research thesis.

### Doctor of Philosophy Degree

(For general requirements see Graduate School regulations.) Requirements for a Doctor of Philosophy degree in geology include: (1) a minimum of thirty hours of formal course work in the major field and a minimum of fifteen hours of formal course work in each of two minor fields (the minors may be in a related field outside of the Department of Geology in which upper-division and graduate courses will be acceptable); (2) one degree or one semester of acceptable graduate study at another institution; (3) successful completion of Graduate School foreign language examinations; (4) a comprehensive examination after sixty hours of graduate work and at least one academic year prior to graduation; (5) dissertation embodying the results of original research; and (6) defense of his dissertation before a formally appointed committee at the close of his final year of study.

### Courses

**501. Rocks and Minerals.** (2:2:0) F.Su. (m) Prerequisite: Geol. 102. Bullock
Introductory study of fundamentals of rock and mineral classification and identification. Designed to acquaint the student with the earth's common raw materials, their occurrences, and uses. For nongeology majors.

**502. Geology for Teachers.** (2:2:0) S.Su. Home Study also. (m) Prerequisite: Geol. 101 and 102, or 103, or 111. Bushman
Designed to acquaint the teacher with sources of information, projects, and illustrative materials useful in the classroom.

**507. Founders and Concepts of Geology.** (2:2:0) F. (Offered 1967-68 and alternate years) Bushman
The historical development of geology and the men who contributed to it; the concepts and philosophy that make geology distinct from other sciences. Analysis of some of the more controversial problems in geology.

**510. Conducted Field Trips.** (1-3:0:3-9) S.Su. Prerequisite: Geol. 101, 103, or 111.
Visits to and explanations of a variety of geologic features spectacularly displayed in the intermountain west. Credit varies with number and length of trips in which student participates, but in general 30 hours will be spent in the field for each credit hour. Preparation for and review of each trip will be conducted on campus. Maximum credit allowable is 3 hours.

**511. Geomorphology.** (3:3:0) S. (Offered 1966-67 and alternate years) Bushman
The historical development of geomorphic concepts. The description of land forms and evaluation of the processes that formed them, and the application of this knowledge to paleogeography and economic geology.

**512. Geology of North America.** (4:3:2) S. Rigby
A region-by-region study of the areal geology, physiography and geologic development of Canada, United States, and Mexico.

**520. Petroleum Geology.** (4:4:0) S. (Offered 1967-68 and alternate years) Hansen
The origin, classification, physical properties, distribution, accumulation, and methods of exploration of petroleum.

**530. Engineering Geology.** (3:3:0) S. (Offered 1967-68 and alternate years) Hansen

The geological principles and phenomena which are important to an understanding of engineering problems (especially civil engineering), and the relationships which exist between the science of geology and the practical aspects of engineering.

**535. Ground Water.** (4:4:0) F. Hansen

The origin, classification, migration, distribution, and production of water found beneath the earth's surface.

**540. Geophysics and Constitution of the Earth.** (2:2:0) F. (Offered 1966-67 and alternate years) Best

Introduction to seismic, gravitative, magnetic and thermal behavior of the Earth emphasizing application of these to interpretation of mantle and crustal phenomena.

**545. Geochemistry.** (3:3:0) F. (Offered 1967-68 and alternate years) Prerequisites: Math. 113, Physics 213, Chem. 106. Brimhall

The kinds of abundances of elements in the earth, their distribution, and the redistribution in various geologic processes.

**551. Optical Petrography.** (4:2:4) F. Prerequisites: Geol. 251, Physics 202 or 213. Phillips

Behavior of light in isotropic and anisotropic media and its application to mineral identification in fragments and thin section using the universal stage.

**552. Igneous and Metamorphic Petrography.** (3:2:2) S. Prerequisites: Geol. 252 and 551. Phillips

Micro-structures, textures, and mineral associations in igneous and metamorphic rocks. Classification systems (Johannsen, C.I.P.W.) and application of phase diagrams to mineral associations.

**561. Ore Deposits.** (4:3:2) F. (Offered 1967-68 and alternate years) Prerequisite: Geol. 460. Bullock

Metallic ore deposits, their origin, classification and distribution. Polished sections of ores will be studied using reflecting microscopes.

**562. Nonmetallic Deposits.** (3:3:0) F. (Offered 1966-67 and alternate years) Prerequisite: Geol. 460. Bullock

A detailed study of nonmetallic mineral deposits, their mode of occurrence, and their application in the modern industrial world.

**563. Mining Geology.** (3:3:0) S. Prerequisite: Geol. 460. Bullock

Methods of mineral exploration, guides for ore search, evaluation and development of mineral properties, methods of extraction and beneficiation of ores.

**574. Principles of Stratigraphy.** (3:2:2) F. (Offered 1966-67 and alternate years) Prerequisite: Geol. 470. Bissell

Study and interpretation of stratified rocks, principles of their origin, distribution, and correlation.

**575. Precambrian and Paleozoic Stratigraphy.** (3:3:0) F. (Offered 1966-67 and alternate years) Hintze

Synthesis of regional stratigraphic relation in North America.

**576. Mesozoic and Cenozoic Stratigraphy.** (3:3:0) S. (Offered 1966-67 and alternate years) Hamblin

The basins of deposition (throughout the U.S.) of Mesozoic and Cenozoic rocks and key fossils associated with them. Special emphasis on the distribution of these rocks in the State of Utah.

**577. Oceanography.** (3:3:0) F. Prerequisite: Geol. 470 (Offered 1966-67 and alternate years) Hamblin

A study of physical processes operating within oceans. Particular emphasis on dynamics of currents, waves, and tides, and the resulting shoreline topography, sedimentary patterns, and sea floor features.

**580. Invertebrate Paleontology (Protozoans through Brachiopods).** (4:3:2) F. (Offered 1967-68 and alternate years) Rigby

Designed for the upper-division and the graduate student who desires a broad background in paleozoology, including morphology, paleoecology, evolution, and stratigraphic significance of invertebrates. Basic course for students planning to do graduate work in paleontology or stratigraphy.

**581. Invertebrate Paleontology (Mollusks through Hemichordates).** (4:3:2) S. (Offered 1967-68 and alternate years) Rigby

Continuation of Geol. 580.

**582. Biostratigraphy.** (3:2:2) S. (Offered 1967-68 and alternate years) Prerequisite: Geol. 480 or 581. Braithwaite

Fossils in their stratigraphic setting and principles of paleontologic chronology.

**583. Palynology.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisites: Bot. 105, Geol. 480. Bushman

Fossil and modern spores and pollens, laboratory techniques in their extraction and identification, application to problems of stratigraphic correlation and paleoecologic interpretation.

**591A,B,C,D. Seminar.** (1:1:0 ea.) F.S.

Required of all graduate students; and required attendance of all seniors.

**610. Structural Geology.** (3:3:0) F. (Offered 1967-68 and alternate years) Hintze

Earth structures and their origin, emphasizing foreign examples.

**615. Photogeology.** (3:1:4) S. (Offered 1966-67 and alternate years) Hintze

Techniques useful to practicing geologists; using parallax bar and various instruments applicable to contact print photos.

**646. Geochemical Techniques and Mineral Prospecting.** (3:2:2) S. (Offered 1967-68 and alternate years) Prerequisite: Geol. 545. Brimhall

A survey of the kinds of techniques employed in geochemical prospecting. About half the course is taken up with a field problem in geochemical prospecting.

**653. X-ray Diffraction.** (3:2:2) S. (Offered 1967-68 and alternate years) Prerequisites: Physics 213 and Geol. 251. Phillips

X-ray diffraction as applied to identification of minerals and determination of crystallographic constants and crystal structure.

**655. Igneous Petrology.** (4:3:3) F. (Offered 1966-67 and alternate years) Prerequisite: Geol. 552. Best

Phase and compositional relations of magmatic systems to equilibria in silicate systems. Evolution of magmas. Field and laboratory study of selected igneous rock suites.

**656. Metamorphic Petrology.** (4:3:3:) S. (Offered 1966-67 and alternate years) Prerequisite: Geol. 552. Best

Subsolidus mineral equilibria; thermodynamic concepts; geologic variables in metamorphic systems; graphical analysis of mineral assemblages; laboratory study of textural and compositional relations of metamorphic minerals.

657. **Structural Geology of Metamorphic Rocks.** (4:3:3) F. (Offered 1967-68 and alternate years) Prerequisite: Geol. 552. Best

Graphic analysis of linear and planar structures in simple and complex fold systems; mechanical behavior of strained rocks; field and laboratory study of metamorphic rocks.

670. **Sedimentation and Sedimentary Tectonics.** (3:3:2) S. (Offered in 1966-67 and alternate years) Bissell

Fundamental concepts in the science of sedimentology, and laboratory exercises illustrative of processes of sedimentation followed by review and discussions of tectonic environments which control sedimentation. Field trips are taken into areas illustrative of the subject matter.

671. **Sedimentary Petrology—Carbonate Rocks.** (3:2:2) F. (Offered in 1967-68 and alternate years) Hamblin

Field and laboratory classifications and studies of carbonate sedimentary rocks.

672. **Sedimentary Petrology—Clastic Rocks.** (3:2:2) S. (Offered in 1967-68 and alternate years) Prerequisite: Geol. 470. Hamblin

Field and laboratory study and classification of clastic rocks, particularly sandstones.

678. **Subsurface Methods.** (3:2:2) S. (Offered in 1967-68 and alternate years) Prerequisite: Geol. 551. Bushman

To acquaint the student with the tools and techniques employed by the sub-surface geologist in describing the lithologic characteristics of sub-surface rock; the use of this information for interpreting sedimentation environments, geologic structures, and stratigraphic correlation.

680. **Micropaleontology.** (3:2:2) S. (Offered 1966-67 and alternate years) Prerequisite: Geol. 480 or 581. Braithwaite

A systematic study of the geologically important microfossils, including techniques, morphology, and stratigraphic significance. Conodonts, ostracodes, foraminifera are stressed.

682. **Vertebrate Paleontology.** (3:3:0) F. (Offered 1966-67 and alternate years) Prerequisite: Geol. 480 or 581, or consent of instructor. Rigby

The background animals through time (Agnatha through Mammalia). Morphology, ecology, phylogeny, and stratigraphic significance are stressed.

685. **Paleoecology.** (4:3:2) S. (Offered 1966-67 and alternate years) Prerequisite: Geol. 480 or 581.

Interpretation of ancient environments and of the adaption of organisms to these environments as shown by a systematic treatment of each of the major taxonomic groups and by selected analyses from the professional geologic literature.

696. **Reading and Conference in Geology.** (1-4:1-4:0) F.S.Su.

697. **Directed Field Studies.** (1-6:Arr.:Arr.) F.S.Su.

Supervised field work in any of the fields of specialization in geology for candidates for master's degree.

698. **Research.** (1-4:1-4:0) F.S.Su.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. (m)

797. **Directed Field Studies.** (1-6:Arr.:Arr.) F.S.Su.

Supervised field work in any of the fields of specialization in geology for candidates for Ph.D. degrees.

799. **Dissertation for Doctor of Philosophy Degree.** (Arr.) F.S.Su.

# Graduate Department of Education

**Professors:** Egbert (chairman, 205 McK), Alley, Bauer, Berryessa, Burrup, Callahan, Christensen, Clarke, Daines, Downing, Jensen, Lloyd, Moffitt, Morrill, Oakes, Ovard, Reid, Romney, Smith, Woolf (emeritus).

**Associate Professors:** Babcock, Baird, Barnett (emeritus), Belt, Crnkovic, Flandro, Hardy, Harms, Harris, Kelly, Moses, Ord, Sucher, Wilcox, Wilson.

**Assistant Professors:** Anderson, Cottrell, Harmon, Harrison, Herlin, Pinegar, Rhode, Shute.

The Graduate Department of Education is organized to offer courses for all persons engaged in professional education and to offer service courses to graduate students in other disciplines.

Programs are designed to give special training to school administrators, school business managers, supervisors, curriculum directors, adult educators, junior college teachers and administrators, educational psychologists, school psychologists, specialists in counseling and guidance, teachers of special education, reading specialists and master teachers. Such programs are intensive and broad in scope. They are designed to give the depth and the breadth needed by specialists in education.

The department offers programs leading to graduate degrees at both the master's and doctoral levels. The Master of Arts and the Master of Education are offered. In addition, both the Doctor of Education and the Doctor of Philosophy are offered by this department.

A program for the sixth-year certificate—Specialist in Educational Administration, Specialist in Curriculum and Instruction (both elementary and secondary), Specialist in Counseling and Guidance, Specialist in Special Education and Specialist in Reading—is offered for school superintendents, assistant superintendents, elementary and secondary school principals, supervisors, curriculum consultants, school counselors, reading specialists and special education coordinators.

The department also offers a sequence of courses leading to junior college certification. Graduate students enrolled in a program leading to a master's degree in an academic subject matter area who complete the required professional education courses can meet junior college certification requirements in states where such requirements exist.

The graduate student is expected to meet all of the general requirements for advanced degrees as outlined by the Graduate School. The initiative for meeting these requirements rests with the student. Detailed description of all masters, sixth-year, and doctoral programs in education are available through the Graduate Education office, Room 205, McK.

## Master's Degrees

**Option I. Master of Arts**

1. Grad. Ed. 552—Statistical Methods.
2. Grad. Ed. 660—Educational Research and Thesis Writing.
3. Grad. Ed. 699—Thesis for Master's Degree.
4. Major—At least fifteen hours
5. Minor—At least nine hours
6. Total hours—At least 30 including Grad. Ed. 552, 660 and 699.

**Master of Education**

1. Grad. Ed. 660—Educational Research and Thesis Writing.
2. Grad. Ed. 698—Field Project. (taught as a class)
3. Major—At least fifteen hours
4. Minor—At least nine hours
5. Total hours—At least 30, exclusive of Grad. Ed. 698.

**Option II. Master of Arts**

1. Grad. Ed. 552—Statistical Methods.
2. Grad. Ed. 660—Educational Research and Thesis Writing.
3. Grad. Ed. 699—Thesis for Master's Degree.
4. Major—At least fifteen hours
5. Minor—At least six hours
6. Total hours—At least 30 including Grad. Ed. 552, 660, and 699

**Master of Education**

1. Grad. Ed. 660—Educational Research and Thesis Writing.
2. Grad. Ed. 698—Field Project. (taught as a class)
3. Major—At least eighteen hours
4. Related—At least nine hours
5. Total hours—At least 30, exclusive of Grad. Ed. 698

**Admission.** Admission to master's degree programs is contingent upon the following:

1. Compliance with admission requirements of the Graduate School.
2. A valid teaching credential or other acceptable preparation in professional education.
3. Evidence of the student's ability to do satisfactory work. (The student's ability to do satisfactory work is determined by the graduate education faculty on the basis of past academic record, recommendations, and scores on the following tests: (1) scholastic aptitude, (2) personality, and (3) English.)

**Thesis or Field Project.** The student must complete a thesis, including registration for Grad. Ed. 699, if he is seeking the Master of Arts degree. Grad. Ed. 698, field project, is taught as a regular class and is required for the Master of Education degree.

**Credit in Residence.** At least twelve semester hours toward the master's degree must be taken on the Brigham Young University campus in Provo.

## EDUCATIONAL ADMINISTRATION

The master's degree in educational administration provides appropriate training for elementary and secondary school principals and for school supervisors.

All students must complete a core of courses covering general administration, supervision and research. Those include Grad. Ed. 660 (required, but does not count for hours toward major), 675, 677 and 680 (not required of those who have had educational administrative experience).

**Elementary.** Those interested in an elementary principalship should take, in addition to the above courses, Grad. Ed. 678.

**Secondary.** Those interested in a secondary principalship should take, in addition to the above courses, Grad. Ed. 679.

**Supervisors.** Those interested in supervisory positions other than principalships should take, in addition to the above courses, Grad. Ed. 678 or 679.

**Minors.** Students minoring in educational administration should take Grad. Ed. 675. 677, 685 and a minimum of two or three additional hours in courses to be selected by the student and his adviser.

## CURRICULUM AND INSTRUCTION

Programs in these fields are designed to provide specifically for the needs of public school supervisors, directors of curriculum, master teachers in subject specialties, and other school personnel with particular interests in the instructional and curriculum areas.

All students must complete a core of courses including Grad. Ed. 560, 552 (M.A. degree), 660 and 698 or 699.

**Elementary Majors.** Those interested in elementary education must take, in addition to the above courses, Foundations of Education (3-6 hrs.), Elementary School Methods (6-10 hrs.), and Grad. Ed. 631. (If desired, students may complete the elementary education program with emphasis in reading.)

**Secondary Majors.** Those interested in secondary education must take, in addition to the above courses, Foundations of Education (3-4 hrs.), Supplemental Courses (3-7 hrs.), and Grad. Ed. 636 and 639.

**Minors.** Students minoring in elementary or secondary curriculum and instruction must take Grad. Ed. 631 or 636 and 626 or 639 and additional hours in courses to be selected by the student and his adviser. Students minoring in junior college curriculum and instruction must take Grad. Ed. 640, 642, and 644.

In fulfilling minor requirements students may elect Option II, which calls for the student's selecting in consultation with his adviser a minimum number of hours in direct support of his major field. Option II does not apply to the junior college minor.

## COUNSELING AND GUIDANCE

The master's degree in counseling and guidance is designed to prepare students for positions as school counselors. Students should have a suitable background of course work in a field such as psychology, sociology, or child development and family relationships.

Except with the written approval of the department, the student must have a valid teaching certificate prior to completing the master's degree. Prerequisite courses to the graduate program are Psych. 111 and 450, and (M.A. programs only) Grad. Ed. 552.

Required courses are Grad. Ed. 550, 645, 646, 651, 671, 691, 660, 698 or 699, Psych. 550, and a minimum of four hours from Grad. Ed. 647, 652, 654, Sociol.-Psych. 555, and Psych. 640.

## EDUCATIONAL PSYCHOLOGY

Except with written approval of the department, the student must have a valid teaching certificate prior to completing the master's degree. In addition to the required graduate courses, the student must have completed or must complete six semester hours of psychology chosen from 311, 320-321, 360, 365, 374, 378, 460 and Grad. Ed. 552.

Required courses are Grad. Ed. 560 or 645, 656, 660, 691, 698 or 699, and additional courses approved by the chairman of the student's advisory committee, generally selected from Tchr. Ed. 460, Grad. Ed. 550, 554, 646, 647, 651, 657, 659, 661, 667, 668, 671 and Psych. 550, 560, 540, 627, 640.

## SCHOOL PSYCHOLOGY

**(Offered jointly with the Psychology Department.)**

To be admitted to this program, the student must have a valid teaching certificate and must present an appropriate background in psychology. For detailed academic requirements of the school psychology program, the student check with the Graduate Department of Education, Room 205 McK.

## SPECIAL EDUCATION

In the graduate program in special education the student is prepared for work with children with intellectual, motor, visual, or academic handicaps. To be admitted to the program the student must have a valid teaching certificate and appropriate professional experience as required for Utah state certification.

All students majoring in this area must complete a basic core of courses and the required sequence of courses in one area of specialization. In addition a stu-

dent may choose a minor field or select courses in related fields approved by his advisory committee. Recommended courses are listed for each area of specialization.

Basic required courses are: Tchr. Ed. 460, Grad. Ed. 568 and 690.

Courses in areas of specialization are:

**Mental Retardation.** Required: Tchr. Ed. 461, 464, Speech 271, Grad. Ed. 564, 567, 569, 667, Zool. 563 and Psych. 626. Recommended: Grad. Ed. 550, 565, 657, 662, 666, 669, Psych. 640.

**Motor Handicapped.** Required: Tchr. Ed. 464, 465, Speech 271, Grad. Ed. 564, 566, 569, 667, Sociol. 550, Zool. 563. Recommended: Grad. Ed., 550, 565, 665, 666, 669, Psych. 585, Speech 647, Psych. 628.

**Visually Handicapped.** Required: Tchr. Ed. 463, Grad. Ed. 563, 569, 667, Zool. 374, Sociol. 550. Recommended: Grad. Ed. 663, 666, 669, Psych. 585, 628.

**Emotionally Handicapped.** Required: Grad. Ed. 564E, 565, 568, 569, 667, 668, 691; Psych. 320 or 321, 540 or Grad. Ed. 657. Recommended: Psych. 340, 350, 365, 378, 450; Sociol. 111 or 112, 360, 383, 552, 555, 678; Grad. Ed. 647, 699.

**Remedial.** Required: Grad. Ed. 560 or 645, 667, 668, 564, 673. Recommended: Grad. Ed. 550, 647; Zool. 563; Psych. 640.

**General.** Required: Grad. Ed. 563, 566, 567, 666, 669. Recommended: Grad. Ed. 550, 560, 564, 565, 573, 664, 667; Zool. 563; Psych. 640.

### REQUIREMENTS FOR A MINOR IN PHILOSOPHY OF EDUCATION

This area in the department currently is organized to provide service courses for graduate students in other areas of the college and University. A minor in this field is provided for graduate students.

Graduate students enrolling in the area of philosophy of education are expected to take first the basic course, Grad. Ed. 601. Variations of this must be approved by the area advisers.

## Sixth-Year Certificate - Specialist in Education

The Graduate Department of Education offers a sixth-year program in each of the following areas:

1. Educational Administration
2. Curriculum and Instruction
3. Counseling and Guidance
4. Special Education
5. Reading

Such programs are planned for the preparation of school superintendents, assistant superintendents, elementary and secondary school principals, supervisors, curriculum directors and consultants, school counselors and pupil personnel directors, reading specialists, and directors or supervisors in special education. Sixty semester hours of acceptable graduate work beyond the baccalaureate degree are required. In addition, all candidates must demonstrate proficiency in statistics of at least the level demanded by Grad. Ed. 554. (For detailed course work requirements the student should contact the Graduate Department of Education, Room 205 McK.)

**Admission.** To be admitted into the program in full standing, the candidate must: (1) present evidence of at least two years of successful professional experience; (2) achieve satisfactory scores on tests of (a) scholastic aptitude, (b) vocational interest, (c) personality, (d) effectiveness of expression, and (e) general educational background; and (3) present evidence of a satisfactory academic background in the area of his intended field of preparation.

**Field Project and Report.** A research project for the improvement of a school program must be conducted under the direction of the student's advisory committee. The report of the field study must meet the usual standards of format and must be submitted under the same schedule and publication requirements as the thesis or the dissertation.

**Examinations.** A qualifying examination is administered near the end of the student's last semester of work. A satisfactory score must be achieved in order to be recommended for the specialist certificate. A final oral examination is administered at the conclusion of the field project.

**Residence.** A student must establish residence by spending at least one full semester on campus during the regular school year.

**Transfer of Credit.** Eighteen semester hours of credit may be transferred from B.Y.U. off-campus centers. Students from other accredited institutions may transfer thirty semester hours from such institutions.

***Special Note.** Any student earning the Sixth-Year Specialist Certificate, without first securing the master's degree, will be awarded a master's degree based on his specialist work.

## Doctor of Education Degree

The Graduate Department of Education offers work leading to the Doctor of Education degree in educational administration, curriculum and instruction, and educational psychology.

**Admission.** To receive full admission into the program, students are tested for familiarity with certain fields of significance to education. Satisfactory scores must be obtained in the following tests: (1) scholastic aptitude, (2) vocational interest, (3) personality, (4) effectiveness of expression, and (5) general educational background.

In addition, students must have completed 22 hours of education or submit evidence of a valid teaching credential, must have at least two years of successful professional experience, (in some programs this is a three-year requirement), and must possess an adequate background in their intended areas of specialization.

**Course Work.** A minimum of seventy-five semester hours of acceptable credit beyond the baccalaureate degree is required to complete the Doctor of Education degree. In addition, all candidates must demonstrate proficiency in statistics of at least the level demanded by Grad. Ed. 554. (For detailed information on the statistics requirement, the student should check in Room 205 McK.)

**Required Courses. All students seeking the Doctor of Education degree must complete the following core of courses (17 semester hours): Grad. Ed. 601, 608, 631 (or 636 or 640), 656, 660, and 675.**

**Examinations. A core qualifying examination** is administered to each doctoral student on completion of the core of required courses: Grad. Ed. 601, 608, 631 (or 636 or 640), 656, 660, and 675. (Since statistical competence is considered prerequisite to the doctoral program, students are also tested on the content normally covered in Grad. Ed. 552 and 554.) This examination should be taken as early as possible.

**A major area qualifying examination** is administered to each doctoral student on completion of courses specifically required in his particular area of emphasis. A final written examination is administered at the completion of all course work. The final oral examination is administered at the conclusion of the field project. (For details of examinations contact the Graduate Department of Education, Room 205 McK.)

**Advancement to Candidacy.** To be eligible for advancement to candidacy the student must pass the qualifying examination, final written examination, and

must submit a prospectus and field project title card approved by his doctoral committee. The student must be advanced to candidacy at least two semesters, or one semester and one summer, prior to receiving the degree.

**Field Project and Report.** A research project for the improvement of a program of administration or instruction must be carried out under the direction of the student's advisory committee. The report of the field study must meet the same standards of format as the Doctor of Philosophy dissertation and must be submitted under the same schedule and publication requirements.

**Residence.** At least two consecutive semesters of work, during each of which a student is registered for not less than 9 semester hours, must be taken on the Provo campus. The two terms of the Summer School can be counted as one semester.

## EDUCATIONAL ADMINISTRATION

The Graduate Department of Education offers work leading to a Doctor of Education degree in educational administration with areas of special emphasis in:

1. General School Administration
   a. Superintendent
   b. Assistant Superintendent for Curriculum
   c. Assistant Superintendent for Teacher Personnel
   d. Assistant Superintendent for Pupil Personnel
2. School Business Management
3. Elementary School Administration
4. Secondary School Administration
5. Administration of Higher Education
6. Administration of L.D.S. Church Education Programs

**In addition to the courses specified for all Doctor of Education students, (see Course Work, p. 118), educational administration students must complete course work as indicated under A, B, and C, below:**

A. **Courses Required of All in Educational Administration.** (7-10 semester hours)
Grad. Ed. 677, 685, 687, 680.*
*Required of all who have not had school administration experience.

B. **Courses Required in Cognate Areas.** (12 semester hours)
A minimum of 12 semester hours is required in appropriate courses selected from the following fields: economics, political science, psychology, sociology, business administration.
The following courses are specifically required: Soc. 449, 470; Pol. Sci. 535.

C. **Courses Required in Areas of Specialization.** (18-25 semester hours)

1. **Elementary.** Students planning to specialize in **elementary school administration** are required to take 22 hours consisting of the following courses: Grad. Ed. 606, 626, 678, 760, 768, 775, 790, 791. In addition students are required to take any of the following courses for which there is no evidence of acceptable undergraduate preparation: Grad. Ed. 623, 625, 632, 633, 634.

   Students are also expected to take a minimum of 14 hours from a group of restricted electives as follows: Grad. Ed. 560, 657, 731, 762, 767, 773; Sociol. 512.

   To complete the course work requirements, students are allowed free electives chosen from either education or cognate areas as determined by the student and his chairman.

2. **Secondary.** Students planning to specialize in **secondary school administration** are required to take 26 hours consisting of the following courses: Grad. Ed. 550, 606, 639, 679, 761, 768, 775, 790, 791.

   In addition, students are expected to take 12 hours from a group of restricted electives as follows: Grad. Ed. 619, 627, 630, 635, 652, 657, 658, 682, 762, 763, 765, 773; Sociol. 512.

   To complete course work requirements, students are allowed free electives chosen from either education or cognate areas as determined by the student and his chairman.

3. **General.** Students planning to specialize in the areas of **general school administration** and the **administration of higher education** are required to take 20 hours consisting of the following courses: Grad. Ed. 606, 678, 679, 773, 775, 790, 701.

   In addition, students are expected to take 14 hours from a group of restrictive electives as follows: Grad. Ed. 626, 631, 636, 639, 645, 652, 653, 682, 709, 731, 760, 765, 767, 768, 770, 771; Sociol. 512.

   Students preparing for the area of **school business management** normally will elect to take Grad. Ed. 765, 767.

   Students preparing themselves for the position of **assistant superintendent of instruction** normally will elect to take Grad. Ed. 626, or 639, 709, 767, 768.

   Students preparing themselves for the position of **assistant superintendent for teacher personnel** normally will elect to take Grad. Ed. 645, 652, 768.

   Students preparing themselves for the position of **assistant superintendent for pupil personnel** normally will elect to take Grad. Ed. 645, 652, 768.

   Students planning to specialize in the area of **administration of higher education** are required to take Grad. Ed. 653, 768, 771.

4. **L.D.S. Religious Education.** Students preparing for the doctorate in **educational administration with an emphasis in L.D.S. religious education,** are required to complete the 17 hours of course work required of all doctoral students and the 7-10 hours of course work required of all in educational administration. Students must complete a 30-hour core in the College of Religious Instruction. Details are available in the College of Religious Instruction.

   Additional required courses in education consisting of 21 hours are Grad. Ed. 606, 639, or 642, 679 or 682, 771, 768, 775, 790, 791.

   The balance of course work may be selected as determined by the student and his advisory committee.

## CURRICULUM AND INSTRUCTION

The Graduate Department of Education offers work leading to a Doctor of Education degree in curriculum and instruction with areas of emphasis in:

1. Elementary Education
2. Secondary Education
3. Junior College Education

**In addition to the courses specified for all Doctor of Education students (see Course Work, p. 118), curriculum and instruction students must complete course work as indicated below.**

**Elementary Education** (63 semester hours). This program will prepare the candidate for such positions as assistant superintendent in charge of curriculum and instruction, college instructor and supervisor of student teaching, subject matter supervisor or consultant, or curriculum consultant in an area of subject specialization. The candidate must take the courses required of everyone in doctorial programs, plus the following courses (29-35 semester hours): CDFR 510, Sociol. 512 (or Sociol. 555 or Grad. Ed. 606), Grad. Ed. 560, 657, 659, 685, 721A, 721B, 721C, 727, 768, 790C, 791B.

In consultation with his doctoral advisory committee, the candidate will select the balance of his required graduate education courses from the following list (8-14 semester hours): Grad. Ed. 610, 623, 624, 625, 627, 628, 632, 633, 634, 637.

A minimum of 20 semester hours of graduate course work will be taken outside the College of Education but representing a discipline or field of study commonly taught in elementary schools. The discipline or field of study will ordinarily be an extension of the candidate's undergraduate subject matter emphasis. The 20 hours must constitute a logical program and have the approval of the doctoral advisory committee.

**Secondary Education** (58 semester hours). This program will prepare the candidate for such positions as assistant superintendent in charge of curriculum and instruction, college instructor and supervisor of student teaching, subject matter supervisor or consultant, or curriculum consultant in an area of subject specialization. The candidate must take the courses required of everyone in the doctoral programs, plus the following courses (17-21 semester hours): Grad. Ed. 560, 639, 685, 722A, 722B, 722C, 727, 762 or 763.

A minimum of 17-21 semester hours of elective graduate course work in the College of Education will be selected in consultation with the candidate's doctoral advisory committee for the following list: Grad. Ed. 603, 606, 607, 610, 619, 627, 657, 659, 667, 790C, 791B or 791C.

A minimum of 20 semester hours of graduate course work will be taken outside the College of Education but representing a discipline or field of study commonly taught in secondary schools. The discipline or field of study will ordinarily be an extension of the candidate's teaching major or minor. The 20 hours must constitute a logical program and have the approval of the doctoral advisory committee.

**Junior College Education.** (58 semester hours) This program will prepare the candidate for junior college administrative positions relating to instruction and continuing education and for junior college teaching positions. The candidate must take the courses required of everyone in the doctoral program, plus the ones listed below (31-32 semester huors): Grad. Ed. 560, 610, 642, 644, 653, 685, 706, 727, 768, 769, 771, 790B, 791B.

A master's degree in an academic subject matter area is required of all candidates seeking specialization in junior college education. Upon approval of his graduate advisory committee, a candidate may substitute 20 semester hours of graduate work in a single academic subject matter area.

The following graduate courses offered in departments outside the College of Education are required (6 semester hours): Psych. 555, Sociol. 512, Indus. Ed. 540.

## EDUCATIONAL PSYCHOLOGY

The Graduate Department of Education offers work leading to a Doctor of Education Degree in educational psychology with areas of emphasis in:

1. Counseling and Guidance
2. Special Education

In addition to the required graduate courses, the student must have completed or must complete six semester hours of psychology chosen from Psych. 311, 320-321, 360, 365, 374, 378, 460, and Grad. Ed. 552.

**In addition to the courses specified for all Doctor of Education students (see Course Work, p. 118), educational psychology students must complete course work as indicated below.**

**Courses Required of All Students in Educational Psychology.** Tchr. Ed. 460, Grad. Ed. 550, 560, or 645, 657; Psych. 540 or 550, 610, 640.

**Counseling and Guidance** (36 semester hours). Students electing the counseling and guidance emphasis will complete Grad. Ed. 646, 647, 651, 652, 671, 690C or 691C, 740, 741 and 15 hours of electives determined in consultation with the chairman of his advisory committee.

**Special Education** (36 semester hours). Details of requirements in special education are available from the Graduate Department of Education, Room 205 McK.

## Doctor of Philosophy in Educational Psychology

The Graduate Department of Education offers work leading to a Doctor of Philosophy degree in educational psychology with areas of special emphasis in:

1. Statistics and Research Methods
2. Measurement
3. Counseling
4. Learning
5. Human Development and Personality
6. Special Education

**Admission.** To receive full admission into the program, students are tested for familiarity with certain fields of significance to education. Satisfactory scores must be obtained in the following tests: (1) scholastic aptitude, (2) vocational interest, (3) personality, (4) effectiveness of expression, and (5) general educational background.

**Course Work.** In completing a doctoral major in educational psychology a candidate will be expected to have:

A. Completed prerequisite courses—Tchr. Ed. 460, Psych. 374 and 450.

B. Competence in a core of required courses—Grad. Ed. 550, 554, 560, 601, 656, 660, 661, or 645, 790, 791, and Psych. 610.

C. Competence in one of the areas of special emphasis listed above (minimum of 12 hours of course work).

D. Completed 10-15 hours in course electives. Electives may be chosen from related or supporting areas to the major field or areas of special interest.

E. Completed 5-10 hours of research in addition to that spent on the dissertation. Research may be conducted in areas of special interest or in related and supporting fields to the research for the doctoral dissertation. (This requirement must include Grad. Ed. 755B.)

F. Competence in a related minor area (minimum of 12 hours of course work) which is approved by the candidate's supervisory committee.

**Examinations.** A qualifying examination is administered to all Ph.D. students on completion of the core of required courses (see B above). A final written examination is administered at the conclusion of all coursework. The final oral examination is administered at the conclusion of the dissertation. (For details of examinations, contact the Graduate Department of Education, Room 205 McK.)

**Advancement to Candidacy.** To be eligible for advancement to candidacy the student must pass the qualifying examination, the final written examination, the foreign language requirement, and must submit a prospectus and dissertation title card approved by his doctoral committee.

**Dissertation.** The student must present a written dissertation embodying the results of original research judged by his committee to be suitable in whole or in part for publication in a national psychological or educational journal.

### Courses

**514, 515. Analysis of In-Service Problems.** (1-3:1-3:1 ea.) F.S.Su.

**534. Experimental Practices in Teaching.** (3:3:1) F.Su. Berryessa, Ord
Current concepts in elementary education with observation and analysis of some of the best teaching practices. Designed to meet the needs of persons seeking a refresher course, and for prospective administrative personnel in the elementary schools.

547. **Foundations in Reading.** (3:3:0) F.S.Su. Daines, Sucher
A consideration of the various approaches to reading. A detailed study of readiness for reading and the different techniques of word recognition as developed in kindergarten through grade twelve.

548. **Directed Observation in the Elementary School.** (2:0:4) F.S.
Directed observation with elementary school pupils. Required for speech therapists who do not have elementary certificates; recommended for teachers who are recertifying and others.

549. **Directed Observation in the Secondary School.** (2:2:0) F.S.
Directed observation with secondary school pupils. Required for speech therapists who do not have secondary certificates; recommended for teachers who are recertifying and others.

550. **Introduction to Guidance Services.** (2:2:0) F.S.Su. Reid
Principles and practices of pupil personnel services in the public schools. Designed for prospective teachers of both elementary and secondary levels. Required but may not be counted as part of the 30 hours for the master's degree by students majoring in this area of specialization.

551. **Evaluation of Educational and Psychological Literature.** (2:2:0) S.Su. Egbert
A consideration of the nature of various kinds of educational publications and of problems involved in interpreting their contents. Not intended for students seeking graduate degrees.

552. **Statistical Methods.** (2:2:0) F.Su.
Measures of central tendency, variability, and linear correlation; elementary concepts of probability and inference. Required but may not be counted as part of the 30 hours for the master's degree by students majoring in this department.

554. **Advanced Statistics.** (2:2:0) S.Su. Prerequisite: Grad. Ed. 552.
Educational applications of analysis of variance; analysis of covariance; multiple and partial correlation; nonparametric methods.

560. **Educational Tests and Measurements.** (3:3:0) F.S.Su. Harris
Principles of standardized testing in the schools. Construction and use of classroom tests. Consideration also given to evaluation techniques other than testing.

563. **Problems in the Education of the Visually Handicapped.** (4:4:0) Arr. Prerequisite: consent of instructor.
Problems confronting administrator and teacher in the different types of school programs now available for the visually handicapped.

564. **Problems in Education of Children With Neurological Impairment.** (2:2:0) F.Su. Wilson
Study of specialized methods and materials for teaching children with learning difficulties due to neurological impairment.

565. **Problems in the Education of Emotionally Handicapped Children.** (3:3:1) S.Su. Prerequisite: consent of instructor.
Organization of educational programs, curricular development and teaching methods for students with emotional problems.

566. **Problems in the Education of Orthopedically Handicapped Children.** (3:3:0) F.S.Su. Prerequisite: Tchr. Ed. 460, 465. Wilson
Problems of identification, diagnosis and placement, organization of educational programs, curriculum development and teaching methods for students with orthopedic handicaps including the homebound and hospitalized.

567. **Problems in the Education of Mentally Retarded Children.** (3:3:0) F.S.Su. Prerequisite: Tchr. Ed. 460, 461.
Problems of identification, diagnosis and placement, organization of educational programs, curriculum development and teaching methods for classes for mentally retarded students.

**568,A,B,C,D,E. Observation and Participation in Special Education.** (2:1:4 ea.) F.S.Su. Prerequisite: consent of instructor.
A—Mentally Retarded; B—Orthopedically Handicapped; C—Visually Handicapped; D—Emotionally Disturbed; E—Hearing Impaired.
Observation and participation in classes for handicapped children. Designed to develop readiness for practicum experience. A laboratory fee of $15.00 is charged, payable upon application for student teaching.

**569A,B,C,D,E. Practicum in Special Education.** (2-4:0:5-10 ea.) Arr. Prerequisite: consent of instructor.
A—Mentally Retarded; B—Orthopedically Handicapped; C—Visually Handicapped; D—Emotionally Disturbed; E—Hearing Impaired.
A laboratory fee of $15.00 is charged, payable upon application for student teaching.

**572. Educational Evaluation of Communication Disabilities.** (2:2:4)
Principles and practices of evaluating communication disabilities of children with emphasis on prescribing education-habilitation procedures. Designed for graduate students in special education, speech pathology—audiology and other school specialists.

**573. Workshop for Teachers of Bilingual Children.** (2:8 hrs/day for 2 weeks) Su.
Study of educational needs, materials, and methods appropriate to the background and language problems of bilingual students.

**578. Practicum for Elementary Teaching.** (2-4-8:2-4-8:5-10-20)

**579. Practicum for Secondary Teaching.** (2-4-8:2-4-8:5-10-20)

**601. Comparative Current Educational Philosophy.** (3:3:0) F.S.Su. (m) Alley

**603. Educational Classes and Contemporary Issues.** (3:3:0) F. (m) Lloyd

**606. History of Education in Europe and America.** (4:4:0) S.Su. (m) Hardy

**607. Education in a World Setting.** (2:2:0) S. Lloyd, Romney

**608. Social Foundations of Education.** (3:3:0) F.S.Su. (m) Clark, Harmon, Ovard

**610. Development of Instructional Materials (Audio-Visual Aids).** (2:2:1) F.Su. Prerequisite: Tchr. Ed. 406 or equivalent.
An advanced course designed to follow Tchr. Ed. 406.
Principles of learning and the unique contributions of newer instructional media. Of primary concern is the selection, integration, and administration of instructional equipment and materials. Construction and use of specialized materials.

**612. Supervision of Student Teachers.** (2:2:0) Su.
For those desiring a well-rounded view of the student-teaching program.

**613. Teaching Speech in Secondary Schools.** (2:2:0) Su.

**616. Analysis of In-Service Problems.** (1-3:1-3:1) F.S.Su.

**619. Directing Out-of-Class Activities in Secondary Schools.** (2:2:0) Su. Flandro
Examination of successful practices in scheduling and directing out-of-class activities. The effect of current scientific curriculum emphasis on out-of-class activities is explored.

**620. Internship in Reading.** (4:0:12) Prerequisite: consent of instructor. Daines, Sucher
Designed to provide experiences for practical work either in the reading center or public schools.

**622. Advanced Study in Childhood Education.** (2:2:0) F. Daines
Educational theory and analysis of current practice in schools as they are related to the significance and problems of early childhood education.

623. **Science in the Elementary School.** (2:2:0) S.Su. Babcock, Berryessa
Designed to give experienced teachers insight into the teaching of elementary science. Includes concentration in unit instruction and methods of presenting science concepts to children.

624. **Advanced Arts and Crafts for Elementary Teachers.** (2:2:1) F.Su. Prerequisite: consent of instructor.
Exploring ideas and materials for the instruction of elementary school children. Attention is given to the specific needs of each course member.

625. **Social Studies in the Elementary School.** (2:2:0) S.Su. Berryessa, Ord
The scope and sequence of the social studies program, its objectives in developing democratic citizenship, and the methods employed in accomplishing this aim.

626. **Methods in the Elementary School: Traditional and Newer Media.** (3:3:0) S.Su. Harmon, Ord
Assessment of readiness; problems of organizing pupils and faculty for instruction, guiding and pacing; and evaluation.
Not open to students who have taken Grad. Ed. 639.

627. **Reading in the Curriculum.** (2:2:0) F.S.Su. Daines, Sucher
Reading in the different content areas. Study of comprehension and study skills as developed in kindergarten through grade twelve.

628. **Children's Literature.** (2:2:0) S.Su. Prerequisite: Tchr. Ed. 340.
Study of the history, authors, illustrators, and types of children's literature. Exploring and evaluating new books for children. Special attention to reading interests at various age levels.

630. **Teaching Mathematics and Science in Secondary Schools.** (2:2:0) Su. Baird
Designed especially for in-service teachers. Emphasis given to the newer methods, materials, and trends in science and mathematics instruction. Lesson plans developed.

631. **Curriculum Development in the Elementary School.** (3:3:0) S.Su. Daines, Ord
Principles and procedures for organizing the instructional program; patterns of curriculum organization; and techniques for change, evaluation, and stabilization of curriculum.

632. **Research and Literature in Reading.** (2:2:0) S.Su. Prerequisite Grad. Ed. 547 and 627. Daines, Sucher
Study of the history of reading. Emphasis placed on the research and current literature in the teaching of reading from kindergarten through grade twelve.

633. **Language Arts in the Elementary School.** (2:2:0) F.Su. Daines
Best practices in modern methods of instruction in listening, speaking and writing with their related skills.

634. **Arithmetic in the Elementary School.** (2:2:0) F.S.Su. Babcock, Baird
Concepts in arithmetic and various activities which will help students acquire correct arithmetical concepts. Special attention to the contributions of research in teaching arithmetic.

635. **Teaching Social Studies in Secondary Schools.** (2:2:0) S.Su. Flandro
Designed to broaden the understanding of curriculum and instruction in secondary school social studies. Relates methods and techniques to the objectives of the social studies.

636. **Curriculum Development in the Secondary School.** (3:3:0) F.S.Su. Belt, Callahan
Analysis of secondary curriculum development in terms of psychological and philosophical principles. Curriculum issues, trends, and current practices are examined.
Not open to students who have taken Grad. Ed. 631.

**637. Organization and Supervision of Reading Programs.** (2:2:0) F.S.Su. Daines
Study of various approaches to teaching reading and ways to organize and supervise reading programs from grades kindergarten through twelve. Practicum experience included.
To be taken toward completion of program and with consent of instructor.

**639. Methods in the Secondary School: Traditional and Newer Media.** (3:3:0) FSu. Belt, Callahan, Wilcox
Problems of organizing pupils and faculty for instruction; analysis of methods; patterns of grouping; programmed learning; team teaching.
Not open to students who have taken Grad. Ed. 626.

**640. Curriculum of the Junior College.** (3:3:0) F.S.Su. Christensen, Smith
Analysis of junior and community college curriculum practices throughout the United States. Relationship of philosophy to curriculum emphasis. Examination of issues, trends, and current practices.

**642. Methods of Higher Education Instruction.** (3:3:1) F.S.Su. Christensen, Smith
Identification of teacher and pupil activities required for conceptual learning at the college level. Appreciation of the college teacher's responsibilities and role as a member of a college staff. Insight into the backgrounds, abilities, interests, and goals of college students and what these mean for instruction. Familiarity with newer tools, teaching materials, and instructional practices.

**644. Directed Teaching in Higher Education.** (2-4:1-2:5-10) F.S.Su. Prerequisite: Grad. Ed. 642. Christensen, Smith
Designed to help students become accomplished and skilled teachers of college classes; to participate effectively as a member of a college staff; and to prepare for and complete the steps necessary to be placed into a college position.

**645. Guidance Testing and Diagnosis.** (3:3:0) F.S.Su. Prerequisite: Grad. Ed. 552. Harris, Jensen
Study of advantages and disadvantages of particular types of tests, practice in interpreting test results, and the implications of test choices and usage.

**646. Counseling Theory and Practice.** (3:3:0) F.S.Su. Prerequisite: completion of or concurrent registration in Grad. Ed. 645, Psych. 450 or 550. Anderson, Downing
Includes an intensive study of the various theories of counseling, important concepts and views of counseling authorities, current research, and accepted practices.

**647. Group Techniques for Counselors.** (2:2:0) S.Su. Prerequisite: Grad. Ed. 646. Anderson
Principles of group guidance and their application.

**650. Guidance Workshop.** (2:2:0) Arr. Prerequisite: Grad. Ed. 550.

**651. Informational Services in Guidance.** (3:3:0) F.S.Su. Prerequisite: Grad. Ed. 550. Downing
Consideration of various aspects of vocation selection including sources of information, use of community resources, counseling procedures, and the filing and use of occupational data. Theories and psychological factors of career selection emphasized.

**652. Administration of Guidance Services.** (2:2:0) Arr. Prerequisite: Grad. Ed. 550. Reid
Major consideration given to the procedures of organizing and administering guidance programs, and methods of dealing with the problems related to these activities.

**653. Student Personnel Services in Higher Education.** (2:2:0) S. Prerequisite: Grad. Ed. 550. Lloyd, Smith

654. **Problems of the Elementary School Guidance Program.** (2:2:0) Downing, Rhode
An intensive consideration of the problems of conducting a guidance program in the elementary school, and the determination of guidance and counseling procedures.

656. **Advanced Educational Psychology.** (3:3:1) F.S.Su. Prerequisite: Tchr. Ed. 403. Bauer, Downing
Principles of effective human learning. Discussion of major learning theories and their significance for classroom procedures and for general educational theory.

657. **Behavior Problems in the Schools.** (2:2:0) F.S.Su. Prerequisite: Tchr. Ed. 403. Bauer, Downing
Study of mental hygiene principles and their application to typical classroom problems.

659. **Educational and Psychological Principles of Programmed Learning.** (3:3:2) S.Su. Prerequisite: Psych. 560 or Grad. Ed. 656. Bauer
Principles involved in the development of programs, and a consideration of values and cautions in the utilization of various programs.

660. **Educational Research and Thesis Writing.** (2:2:0) F.S.Su. Prerequisite: Grad. Ed. 552. Cottrell, Harrison
The nature of science and the scientific method; methods of educational research; preparation of the research proposal; preparation of the research report.

661. **Experimental Educational Psychology.** (3:2:4) F. Prerequisites: Grad. Ed. 554 or Stat. 501 and Psych. 374 or Grad. Ed. 660. Egbert
Application of experimental techniques in psychology to problems of education. Particular attention given to research design in areas of human motivation and learning.

662. **Workshop: Curriculum and Methods for the Mentally Retarded.** (2:8 hrs. a day for 2 weeks) Su.
Study of curriculum and methods; the development of materials and teaching aids for the mentally retarded.

663. **Workshop: Curriculum and Methods for the Visually Handicapped.** (2:8 hrs. a day for two weeks) Su.
Study of curriculum and methods; development of materials and teaching aids for the visually handicapped.

664. **Workshop: Curriculum and Methods for the Gifted.** (2:8 hrs a day for 2 weeks) Su. Wilson
Study of curriculum and methods; development of materials and teaching aids for the gifted.

665. **Diagnostic and Therapeutic Services for the Orthopedically Handicapped.** (2:2:0) Su.
Study of community resources and procedures for the diagnosis of children with orthopedic handicaps and the ancillary therapy and treatment services provided for these children.

666. **Special Education Services in Public Schools.** (2:2:0) F.Su.
Problems of organization, administration and supervision of special education services in the public schools.

667. **Diagnosis of Achievement Difficulties.** (2:2:0) F.S.Su. Prerequisite: Grad. Ed. 560 or 645. Bauer, Harris
Survey and use of diagnostic techniques in identification and evaluation of learning difficulties.

**668. Remedial Teaching Techniques.** (2:2:0) F.S.Su. Prerequisite: Grad. Ed. 657 or consent of instructor. Bauer
Remedial procedures applicable to basic subjects with major emphasis in reading.

**669. Guidance and Counseling for the Handicapped.** (2:2:0) S.Su. Prerequisite: Tchr. Ed. 460.
Principles and techniques of guidance services for the physically, mentally, or socially handicapped with study of effective counseling techniques. Required for California certification.

**670A,B. Observation and Participation in Remedial Teaching.** (2:1:4)
A—Corrective; B—Clinical.
Observation and participation in classes of children with academic handicaps.

**671. Practicum in Testing and Counseling.** (5:2:10) F.S.Su. Prerequisite: consent of instructor. Kelly

**673A,B. Practicum in Remedial Teaching.** (2-4:1-2:4-8) F.S.Su. Prerequisites: consent of instructor and Grad. Ed. 670.
A—Corrective; B—Clinical.
Supervised experience in working with academically retarded children; including individualized program planning, remedial teaching techniques and evaluation. A fee of $15.00 for two semester hours and $25.00 for four semester hours is charged, payable upon application for practicum.

**675. Organization and Administration of Public Schools.** (3:3:0) F.S.Su. (m) Christensen, Morrill
An introduction to the principles, practices, and procedures in modern public school administration. Particular emphasis on the problems and responsibilities of the school administrator.

**677. Public School Finance.** (2:2:0) F.S.Su. (m) Burrup, Christensen
Designed with emphasis on theory, principles, and general practices of public school finance. Major emphasis includes: understanding the problems of financing education; budgeting; equalization; management of school funds; the role of the local, the state, and the federal government in the financing of public education. (Special attention is given to Utah finance structure and problems.)

**678. The Elementary School Principalship.** (3:3:0) F.S.Su. (m) Harms
A study of the duties and role of the elementary school principal in providing leadership in the education of children and of problems of elementary school administration. Required for advanced degrees and certification in elementary school administration.

**679. The Secondary School Principalship.** (3:3:0) F.S.Su. (m) Burrup, Ovard
Understanding the leadership role of the principal in organizing and adapting the secondary school program to the educational needs of youth.

**680. Field Work in Educational Administration.** (3:1:4) F.S.Su. (m). Clarke, Harms
This course is intended to provide practical work experience on the job. Students planning to register for Grad. Ed. 680 should obtain consent of the instructor six weeks prior to registration.

**682. Personnel Problems of the School Staff.** (2:2:0) S.Su. (m) Barnett, Christensen
The meaning and scope of personnel problems.

**685. Supervision of Education.** (3:3:0) F.S.Su. (m) Harms, Moffitt
Development of an understanding of the principles of supervision, curriculum, planning and in-service training in the improvement of instruction.

**687. School Law.** (2:2:0) F.Su. (m) Barnett, Burrup
Treats the following areas: their relationship and function with education in the U.S. Legal terms as applied to education. Origin and functional aspect of the law as it affects public education. Parochial schools and public financed educational institutions. Organization and administration, legal aspects of state and local district school finance, personnel and pupil administration, and school boards.

**690A,B,C. Seminar.** (2:2:0 ea.) F.Su. (m)
A—Counseling; B—Special Education; C—Educational Psychology.

**693, 694. Independent Readings.** (1-2:3-6:0 ea.) F.S.Su. (m)

**696, 697. Independent Research.** (1-2:3-6:0 ea.) F.S.Su. (m)

**698. Field Project.** (2-4.Arr.:Arr.) F.S.Su.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

**706. Objectives and Programs of Continuing Education.** (2:2:0) Su. Shute

**709. Philosophy of Program Planning.** (2:2:0) S. Alley

**721A,B,C. Internship in Elementary Education.** (2-4:1-2:2-4 ea.) F.S.Su. Daines, Ord
A—Instruction; B—Curriculum; C—Supervision.
Involvement for a prolonged period of instructional experimentation, curriculum development, or supervision of in-service teachers in a school district recognized for the excellence of its instruction and curriculum. Emphasis is placed on the planning and implementation of experimental and development work under the supervision of highly qualified graduate instructors.

**722A,B,C. Internship in Secondary Education.** (2-4:1-2:2-4 ea.) F.S.Su. Belt, Callahan
A—Instruction; B—Curriculum; C—Supervision.
Involvement for a prolonged period in instructional experimentation, curriculum development, or supervision of in-service teachers in a recognized school district. Emphasis is placed on experimental and development work under qualified supervision.

**727. Curriculum of the Public Schools.** (2:2:0) S.Su. Callahan, Daines, Smith
Study of: (1) problems of articulation among all public school levels; (2) the continuity of the curriculum from one level to another; (3) the concerns of curriculum construction.

**731. System Analysis and Design in Education.** (2:2:0) F.Su. Egbert
The systems approach and its application to the analysis and design of educational systems. Includes procedures for introducing new media and methods in education.

**740. Advanced Counseling Theory.** (2:2:0) F.Su. Prerequisites: Grad. Ed. 646, Psych. 550. Anderson
Advanced work in counseling theory. Includes an intensive study of the various theories and their application to counseling.

**741. Practicum in Counseling.** (3:1:8) S. Prerequisite: consent of instructor. Anderson
Experience in counseling in a center. Open only to advanced doctoral students.

**745. Internship in School Psychology.** (2-4:1-2:4-8) Arr. Prerequisite: consent of instructor. Harris, Moses
Supervised practice in testing, diagnosis, and case work with children in the public schools. Variety of community experiences related to school psychology work.

**755A,B. Internship in Educational Psychology.** (4:2:8 ea.) F.S.Su. Prerequisite: consent of department chairman.

A—Special Education; B—Research.

Supervised practice in one or more of the following settings: schools, clinics, hospitals or laboratories. This experience will help prepare the student for advanced professional service in his special field.

**760. Problems of Elementary School Administration.** (2:2:0) Su. (m) (Offered Fall and Spring Semesters, alternate years, starting fall, 1966) Harms

A study of the problems, issues and areas of difficulty encountered by the elementary school principal.

**761. Problems in Secondary School Administration.** (2:2:0) Su. (Offered Fall and Spring Semesters, alternate years, starting fall, 1966) Clarke, Ovard

This course would identify and select major problems of the modern secondary school principal and be concerned with the systematic and wise solution of major problems which affect the operation of the school.

**762. The Junior High School.** (2:2:0) S.Su. (m) Clark, Ovard

History, purposes, organization, present practices and problems.

**763. The Senior High School.** (2:2:0) F.Su. (m) Clarke, Ovard

Purposes, organization and curriculum.

**765. Business Administration of the Public Schools.** (3:3:0) Su. (m) Burrup

Covers the functions, organization and structure of business administration in public schools. Emphasis on income, budget preparation, auditing and central office business procedures.

**768. Leadership Functions in Educational Administration.** (3:3:0) F.S.Su. (m) Christensen, Morrill

A study of developmental leadership theory concepts, and strategies essential to successful administrative processes; with opportunity for some leadership experiences provided.

**769. School-Community Relations.** (2:2:0) S.Su. (Offered Fall and Spring Semesters, alternate years, starting fall, 1966) Morrill

The introduction and development of concepts, principles, and techniques in the organization, initiation, and operation of a planned program of school-public relations.

**770. Organization and Administration of Continuing Education.** (2:2:0) S.Su. (m) Shute

**771. College and University Organization and Administration.** (2:2:0) F. (m) (Offered alternate years) Oakes, Smith

**773. Public School Building Programs.** (3:3:0) S.Su. (m) Morrill, Ovard

Principles, problems and practices in the planning, organization and administration of public school building programs.

**775. Educational Administrative Theory.** (3:3:0) F.S.Su. (m) Christensen, Oakes

Designed to provide insights into the development of a theory of educational administration in relation to the practical or imperical administrative functions.

**780. Internship in Educational Administration.** (2-6:0:6-18) F.S. Burrup, Christensen

**790A,B,C Seminar.** (2:2:0) F.Su. Prerequisite: consent of instructor.

A—Educational Administration; B—Educational Measurement; C—Curriculum and Instruction.

**791A,B,C. Seminar.** (2:2:0) S.Su. Prerequisite: consent of instructor.
A—Educational Administration; B—Learning Theory Applied to Education; C—Curriculum and Instruction.

**798. Field Project for Ed.D. Degree.** (Arr.) F.S.Su.

**799. Dissertation for Ph.D. Degree.** (Arr.) F.S.Su.

# Health and Safety Education

**Professors:** Watters (chairman, 213 RB), Hartvigsen, Heaton, Nicholes.
**Associate Professor:** Shaw.

### Requirements

An undergraduate major or equivalent in health and safety education and acceptance by the department chairman are necessary for admission. The qualifying written or oral examination will be given to each student before final acceptance. The purpose of the examination is to give guidance in courses and studies leading to the master's degree.

The recommended graduate program is set up after consultation with the student's major chairman, with the approval of the department chairman. A student may pursue one of two degrees.

The Master of Science degree requirements in health and safety education are the same as the general Graduate School requirements. A student must complete a minimum of 24 hours of prescribed course work, an approved thesis, and satisfactory performance in a final oral examination.

The Master of Health Education (M.H.Ed.) will be awarded upon completion of the following requirements:

A. An undergraduate major or equivalent and acceptance by the department for admission. A candidate must successfully complete a written or oral examination before accepted as a full degree-seeking student.

B. The candidate will complete the same general requirements as all other masters degree candidates with the following exceptions:
   1. The candidate will complete not less than 32 hours of credit approved by his advisory committee. Not less than 18 hours will be taken in his major field, and not less than 9 hours in the approved minor, or not more than 12 hours in two or more related fields. The candidate will not be required to write a thesis.
   2. a. A course in statistical methods, 2 semester hours, or its equivalent, is required the first term of residence as a prerequisite to a methods of research class.
      b. A course, Methods in Research (3:3:0), will be required for the first or second term of residence. In this class the candidate must complete a research project which conforms to the standards of a thesis for approval by the instructor and the graduate committee chairman.
   3. The candidate will also be required to work with the Utah County Public Health Department on a specific practical problem of community health.

C. The candidate must pass a final written and oral examination related to the major course work. The oral will be conducted by the graduate faculty members from the major, minor, or supporting fields.

### Courses

☐**Bact. 311. Sanitation and Public Health.** (2:2:0)

☐**Psych. 321. Psychology of Adolescence.** (2:2:0)

☐**Bact. 331. Microbiology.** (5:3:6)

☐**Psych. 340. Mental Hygiene.** (2:2:0)

☐**P.E. 344. Physiology of Activity.** (3:3:0)

☐**Bot. 376. Genetics.** (3:3:0) Prerequisite: Bot. 101 or Zool. 105.

☐**Zool. 376. Genetics.** (3:3:0)

☐**Zool. 465. Animal Physiology.** (4:4:3)

**501. Health Education Workshop.** (1-2:Arr.:0) F.S.Su.
Intended primarily for extension credit and/or summer school. Involves a presentation of health education problems followed by discussions. Conducted on a workshop basis.

**521. Evaluation and Selection of Health and Safety Material.** (2:2:0) F.
Pamphlets, brochures, films, textbooks, and other school health resource materials are evaluated and selected for present and future use.

**530. First Aid Instructorship.** (2:2:1) F. Watters
Designed to qualify instructors in Red Cross first aid, so that they may conduct classes to qualify individuals for standard and advanced Red Cross cards.

☐**Psych. 450. Abnormal Psychology.** (3:3:2)

☐**P. E. 543. Problems in Athletic Conditioning and Injuries.** (2:1:2)

☐**Grad. Ed. 550. Introduction to Guidance Services.** (2:2:0)

**551. Field Work in Community Health.** (2:Arr.:Arr.) S. Prerequisite: Health 451.
Designed to broaden the understanding of community health agencies, their roles, programs, and relationships. Accomplished by field introductions to the various official and voluntary health agencies followed by the selection of agencies in which to do field work during the semester.

☐**Grad. Ed. 552. Statistical Methods.** (2:2:0)

**552. School Health: Organization and Services.** (2:2:0) S.
Considers desirable school health services and functions and relationships to public education and education law. Coordinates school health services with community programs.

**560. Stimulants and Depressants.** (2:2:0) F. Nicholes
The physiology and biological chemistry of stimulants and depressants.

**561. Health of the Body Systems.** (3:3:0) S. Prerequisite: Zool. 365 or equivalent. Nicholes

☐**Geog. 580. Geography of Underdeveloped Areas.** (2:2:0)

☐**Psych. 585. Advanced Physiological Psychology.** (3:3:0)

☐**P. E. 641. Principles and Practices of Physical Reconditioning.** (2:2:0)

☐**Grad. Ed. 646. Counseling Theory and Practices.** (3:3:0)

☐**Zool. 662. Advanced Physiology.** (2:1:2)

**691. Graduate Seminar.** (0:Arr.:Arr.) F.S.Su.
A seminar for graduate students in health and safety education. Reviews course work, testing procedures, professional agencies, and current trends in health education.

☐**P.E. 691. Seminar in Administration and Public Relations.** (3:3:0)

☐**692. Research Methods in Health and Safety Education.** (3:3:0) Heaton

□**P.E. 692. Research Methods in Health, P.E., and Recreation.** (3:3:0)

**693. Research in Health Science.** (2:1:2) F.S.Su.
Independent and/or directed research in problems associated with the health sciences. Gives credit to graduate students involved in directed or independent research from grant-in-aid, fellowship, or contract grant support.

**694. Seminar in Readings.** (2:2:0) S.Su.

**696. Seminar in Problems.** (1:1:0) F.Su.

**698. Field Project.** (1-4:Arr.:Arr.) S.Su.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# History

**Professors:** Campbell (chairman, 336 Maeser), Hafen, Poll, Swensen.
**Associate Professors:** Addy, Allen, Hyer, Jensen.
**Assistant Professors:** Alexander, Bushman, Cardon, Marlow, Warner.

### Requirements

The Department of History offers work leading to the Master of Arts and Doctor of Philosophy degrees.

A student undertaking work toward a graduate degree in history is expected to offer an undergraduate major in the subject, or its equivalent. He is expected to complete, outside his graduate degree program, any courses which are specifically listed in the undergraduate major program of this University which he has not already taken. In addition to the documents required by the University for admission to degree-seeking status, the prospective student is asked to provide the department with a term paper or comparable example of his undergraduate written work in history. Unless he has already taken the departmental senior comprehensive examination as an undergraduate, he may be asked to take it prior to admission to degree-seeking status; in either case a grade of "B" is ordinarily prerequisite for such admission. Where remediable deficiencies in preparation are believed to exist, the department may prescribe undergraduate course work as a condition of admission.

### Master's Degree

The requirements for a Master of Arts degree in history are the general requirements of the Graduate School and one graduate seminar.

### Doctor of Philosophy Degree

The requirements for a Doctor of Philosophy degree in history include the general University regulations on minimum full-time study, time limit, committee supervision, and language proficiency of the Graduate School, with these additional provisions:

At least two semesters of the required full-time study at Brigham Young University must be consecutive.

Upon completion of the master's degree or at the end of the first year of graduate study, the student must obtain the approval of the department to continue study toward the doctorate degree.

**Course Requirements.** Course work in the following areas must be completed:

Historiography and methods of historical research
Methods of teaching history in college
At least one graduate course in each of the fields offered for examination.
One Ph.D. seminar in major field.

**Subject Examinations.** When, in the opinion of the advisory committee, the student is ready, and in no case earlier than the beginning of the second year of graduate study, he may take the subject examinations in the following sequence:

Written Examinations: The student is required to show familiarity with basic bibliography, interpretations, and main historical developments in all four of the student areas of history, and in his related field. Both hemispheres must be represented in the history areas chosen. The areas of history are these:

Ancient History
Medieval History
Modern European History (1500-1800)
Modern European History (1800-present)
Latin American History
History of Asia
United States History (to 1865)
United States History (since 1865)
Western American History

Oral Examination: The oral examination, which must be taken not less than six months prior to the awarding of the degree, deals intensively with the factual structure, major concepts and interpretations, and bibliography in the field of major emphasis and research, and reviews also the additional areas.

All the written examinations must be satisfactorily completed before the oral examination may be taken. In the event of failure any examination may be repeated once, no less than one semester after the unsatisfactory performance. Successful completion of the subject examinations is the basis for advancement to candidacy for the doctor's degree.

**Dissertation.** The student must present a dissertation which represents an original contribution to historical knowledge and which shows ability to use sources in a discriminating way. In a final oral examination he is tested on the historical setting, subject, and methods of the dissertation, and is expected to defend its conclusions.

### Courses

606. **Greek Thought.** (2:2:0) S. (Offered 1966-67 and alternate years) Swensen
Study of Greek intellectual and philosophical thought, and its relationship to Greek institutions.

607. **Greek and Roman Historians.** (2:2:0) F. (Offered 1967-68 and alternate years) Swensen
A critical study and reading of the works of these ancient historians, an evaluation of their historical methodology and interpretation, and their relations to their historical background.

612. **Medieval Thought and Culture.** (3:3:0) F. (Offered 1966-67 and alternate years) Swensen
Study of the basic Medieval achievements in philosophy, science, theology, literature, and education.

618. **Problems in Early Modern Europe.** (3:3:0) S. (Offered 1966-67 and alternate years) Jensen
Extensive reading, analysis and interpretation of selected historical problems of the 16th, 17th, and 18th centuries.

621. **Problems in Modern Europe.** (3:3:0) F. (Offered 1967-68 and alternate years) Cardon
Extensive reading, analysis and interpretation of selected historical problems of the 19th and 20th centuries.

625. **European Diplomatic History Since 1815.** (2:2:0) S. (Offered 1967-68 and alternate years) Cardon
Interprets "diplomacy" broadly. Emphasis on the relationship between European diplomatic history and the domestic history of the major world powers, including the U. S. and Russia.

628. **European Thought and Culture to 1800.** (2:2:0) F. (Offered 1966-67 and alternate years) Jensen
Intellectual and cultural movements of the 16th-18th centuries. Emphasis is on humanism, reformation ideologies, the rise of scientific thought, rationalism and the enlightenment.

629. **European Thought and Culture Since 1800.** (2:2:0) S. (Offered 1967-68 and alternate years) Cardon
The most influential intellectual and cultural movements of the 19th and 20th centuries, their forms of expression, and their impact on the contemporary world.

640. **The Far East.** (2:2:0) F. 1966-67. S. 1967-68. Hyer
Extensive reading, analysis and interpretation of selected problems of Asian development with emphasis on China, Japan, and India.

648. **Culture of Asia.** (2:2:0) S. 1966-67. F. 1967-68. Hyer
Reading in depth and discussion of problems in Asian culture.

650. **Latin America.** (2:2:0) F. (Offered 1967-68 and alternate years) Addy
An advanced study of the generalized historical development of Latin America—colonial and national periods considered.

656. **Southwestern United States.** (2:2:0) F. (Offered 1967-68 and alternate years) Hafen, Warner
Selected problems in the area of Spanish colonization and United States fur trappers.

665. **The Rocky Mountain West.** (2:2:0) S. (Offered 1966-67 and alternate years) Alexander, Allen
Political and economic development of Arizona, Colorado, Idaho, Montana, Nevada, Wyoming, and Utah. Emphasis on sources and problems.

666. **Problems in Utah History.** (2:2:0) F. 1966-67. S. 1967-68. Alexander, Campbell, Poll
Reading in depth in the documents and discussion of interpretations of important events in Utah history.

667. **Northwestern United States.** (2:2:0) S. (Offered 1966-67 and alternate years) Allen, Hafen
History of the Oregon Territory as it developed into the states of Washington, Oregon, and Idaho.

670. **Problems in Colonial America and the Revolution.** (3:3:0) F. (Offered 1967-68 and alternate years) Backman, Bushman

672. **Problems in the Foundation of the American Republic.** (2:2:0) F. (Offered 1966-67 and alternate years) Bushman

675. **Problems in the Early American Republic (1800-1848).** (3:3:0) S. (Offered 1966-67) Campbell

677. **Problems in Civil War and Reconstruction.** (3:3:0) F. (Offered 1966-67) Poll

678. **Problems in the Emergence of Modern America (1880-1920).** (3:3:0) S. (Offered 1967-68 and alternate years) Alexander, Marlow

679. **Problems in Contemporary American History.** (3:3:0) F. (Offered 1966-67 and alternate years) Marlow, Poll

685. **Historical Geography of United States.** (2:2:0) S. (Offered 1966-67 and alternate years)
The bearing of climate, resources, and other geographical factors upon American development.

690. **Special Studies in History.** (2:2:0) F. 1966-67. S. 1967-68.
Advanced research and analysis of important historical problems and movements.

**693 A,B,C,D. European Seminar to 1800.** (2:2:0) F. Addy, Jensen

**694 A,B,C,D. European Seminar Since 1800.** (2:2:0) S. Cardon

**695 A,B,C,D. Seminar in Western American History.** (2:2:0) F. 1966-67. S. 1967-68.

**696 A,B,C,D. Seminar in United States History.** (2:2:0) S. 1966-67. F. 1967-68.

**697. Seminar in Utah History.** (2:2:0) S. 1966-67. F. 1967-68.

**698. Special Readings in History.** (1-2:0:Arr.) F.S.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.

**799. Dissertation for Doctor's Degree.** (1-4:0:Arr.) F.S.

# Industrial Education

**Professors:** Jeppsen, McArthur.
**Associate Professor:** Hinckley (chairman, 240H SIE).

### Requirements

The basic requirements for the Master of Science degree in industrial education are those specified by the Graduate School. In addition the department requires the following:

(a) Satisfactory completion of 30 semester hours of industrial and technical undergraduate courses prior to or concurrent with the graduate work, or a minimum of 6 years of bonafide trade experience.

(b) Satisfactory completion of a qualifying examination given by the Industrial Education Department.

Through consultation with his adviser, a program of study is set up from courses in the major and related fields which shall include 24 or more semester hours in the major area and 9 or more semester hours in the minor area.

### Courses

**505. Industrial Arts for Elementary School Teachers.** (2:2:0) F.Su.
Nature and needs of teachers instructing industrial arts in the elementary schools with emphasis on content and procedures.

**540. Industrial Occupational Information and Guidance.** (2:2:0) S.Su. Hinckley, McArthur
Designed to provide teachers and administrators of industrial and technical education programs with information and processes needed in advising students in the industrial and technical fields of employment.

☐**Grad. Ed. 552. Statistical Methods.** (2:2:0)

☐**Grad. Ed. 560. Educational Tests and Measurements.** (2:2:0) (or Grad. Ed. 658)

**595 A,B,C. Problems in Industrial and Technical Education.** (1-3:0-3:3-9 ea.) F.S.Su.
Designed to strengthen the student in a given area of instruction provided in the industrial education program. Limited to a maximum of 6 credit hours.

**610. History and Trends in Industrial and Technical Education.** (2:2:0) F.Su. McArthur
Historical developments of industrial and technical education programs from their early beginnings to the present time.

**615. Principles and Objectives of Industrial and Technical Education.** (2:2:0) F.Su. McArthur
General philosophy, principles, and objectives of industrial arts, vocational education, and technical education programs.

**620. Analysis in Industrial and Technical Education.** (2:2:0) F.Su. Prerequisite: Indus. Ed. 515 or consent of instructor. Hinckley
Basic principles involved in analyzing industrial and technical occupations for determining functional teaching content.

**625. Course Construction in Industrial and Technical Education.** (2:2:0) S.Su. Prerequisite: Indus. Ed. 520 or consent of instructor. McArthur
Preparation and use of a course of study in industrial and technical fields based upon an analysis of the occupation.

☐**Grad. Ed. 658. Educational Tests and Measurements.** (2:2:0) (or Graduate Education 560).

☐**Grad. Ed. 660. Educational Research and Thesis Writing.** (2:2:0)

**690, 691. Seminar.** (1:1:0 ea.) Su.
Latest developments and research findings in the field of industrial and technical education are reviewed.

**694 A,B,C. Reading and Conference.** (1-3:1-3:0 ea.) F.S.Su.
Limited to a maximum of 6 credit hours.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Institute of Government Service

**Professor:** Grow (director, 285 Maeser).

The Institute of Government Service offers graduate studies leading to the Master of Science degree in the fields of public administration (state and local government and national government) and the Master of Arts degree in international affairs. The aim of the program is to provide training for those students who wish to prepare for service in local, state, federal, or international governmental activities, international trade, or who plan further advanced graduate work in public administration for the purpose of teaching.

### Administration of the Program

The program is administered by the director of the Institute of Government Service. Program policy is formulated by the director and an advisory committee composed of the chairmen of the Departments of Political Science, History, Language, Sociology, Phychology, Economics, Geography, and English.

### Entrance Requirements

To be admitted, an applicant must possess the bachelor's degree from an accredited university and meet the requirements of Brigham Young University for admission to graduate study. Students may be admitted from a variety of backgrounds. Those who have majored or minored in political science, economics, history, psychology, business, geography, languages, or engineering will generally possess good training. When application for admission is made, each applicant will be advised of any background shortages which will need to be overcome.

Each student admitted will either be personally interviewed or his credits given close scrutiny to assess his educational background, his work experience, and his future goals. A program will then be outlined which will remedy any background shortages and provide advanced training leading to the master's degree. Entering students will be required to have adequate preparation in such

fields as national history, national government, or basic economics. If the student lacks such background, he will be required to take lower division background courses which will not be counted toward the master's degree. Students entering with a background of education in the United States will be required to have or to take the equivalent of History 120 and 121, Political Science 110, and Economics 101. Foreign students will be required to have equivalent history and political science courses relating to their own countries and similar training in economics.

**Requirements for the Degree**

The master's degree may be awarded following the completion of either of the following options:

Option 1—30 or more hours of acceptable graduate credit including a thesis. The thesis may count for 6 hours of credit.

Option 2—40 or more hours of acceptable graduate credit including a project. The project will account for 1 to 2 hours of credit.

In each option, twenty or more hours of credit must be in the 500 and 600 series of numbered classes.

**PROGRAM A. State and Local Governments.** Students specializing in this area will be required to have background indicated plus Political Science 111 or its equivalent and to take 30 or more hours selected in conjunction with the director of the Institute of Government Service or the student's advisory committee from the following courses or their equivalents:

Pol. Sci. 300 Research and Writing in Political Science. (3 hours)
Pol. Sci. 310. Parties and Pressure Groups in the U. S. (3 hours)
Pol. Sci. 315. Public Opinion and Propaganda in the U. S. (2 hours)
Pol. Sci. 320. American Legislative System. (3 hours)
Pol. Sci. 321. Political Behavior. (3 hours)
Pol. Sci. 323. Intergovernmental Relations in the U. S. (3 hours)
*Pol. Sci. 330. Introduction to Public Administration.
Pol. Sci. 351. Communist Governments and Politics. (3 hours)
Pol. Sci. 360. Constitutional Law of the U.S. I. (3 hours)
Pol. Sci. 361. Constitutional Law of the U.S. 11. (3 hours)
Pol. Sci. 500. Research and Writing in Public Administration. (3 hours)
Pol. Sci. 531. Principles of Public Organization and Management. (3 hours)
Pol. Sci. 532. Personnel Administration. (3 hours)
Pol. Sci. 533. Budget and Fiscal Administration. (3 hours)
Pol. Sci. 534. State Government and Administration. (3 hours)
*Pol. Sci. 535. Municipal Government and Administration. (3 hours)
Pol. Sci. 536. City Planning. (3 hours)
Pol. Sci. 537. Public Works and Safety Administration. (3 hours)
Pol. Sci. 690. A,B,C,D. Seminar in Political Theory. (1-3 hours)
Pol. Sci. 691. A,B,C,D, Seminar in Politics. (1-3 hours)
Pol. Sci. 693. Seminar in Public Administration. A.B.C.D.
Pol. Sci. 694. Project in Public Administration.
Pol. Sci. 696. A,B,C,D. Seminar in Public Law. (1-3 hours)
Pol. Sci. 698. Directed Readings in Political Science. (1-2 hours)
Geog. 522. Urban Geography. (3 hours)
Bact. 311. Sanitation and Public Health. (2 hours) or 321.
Econ. 311. Income Analysis.
Econ. 402. Real Estate and Urban Land Economics. (3 hours)
Econ. 461. Labor Relations. (3 hours)
Econ. 462. Economics of the Labor Market.
Econ. 475. Government Finance. (3 hours)
Econ. 675. Introduction to Advanced Government Finance.
Sociol. 220. Social Statistics. (3 hours)
Sociol. 316. Social Control. (2 hours)

*Required courses.

Sociol. 357. Group Relations and Leadership. (3 hours)
Sociol. 380. Criminology. (3 hours)
Sociol. 426. Sociology of Urban Life. (3 hours)
Sociol. 499. Community Organization, Action, and Planning. (2 hours)
Anthrop. 432. Political Institutions of Primitive People. (3 hours)
Anthrop. 471. The American Culture. (3 hours)
Stat. 221. Principles of Statistics. (3 hours)
Commun. 535. Public Relations. (3 hours)
Psych. 330. Industrial Psychology. (2 hours)
Psych. 350. Introduction to Social Psychology. (3 hours)
*Psych. 357. Group Relations and Leadership. (3 hours)
Psych. 370. Elementary Statistics. (4 hours)
Psych. 555. (Soc.-Psych.) Group Dynamics. (2 hours)
Engl. 380. Twentieth Century Literature. (5 hours)
Psych. 336. Personnel Psychology—Basic Theory and Procedure. (2 hours)
Psych. 337. Personnel Psychology—Practicum. (2 hours)

**PROGRAM B: National Government.** Students specializing in this area will be required to take 30 or more hours selected in conjunction with the director of the Institute of Government Service and the student's advisory committee from the following courses or their equivalents:

Pol. Sci. 302. Introduction to Political Philosophy. (3 hours)
Pol. Sci. 310. Parties and Pressure Groups in the U.S. (3 hours)
Pol. Sci. 315. Public Opinion and Propaganda in the U.S. (2 hours)
Pol. Sci. 320. American Legislative System. (3 hours)
Pol. Sci. 321. Political Behavior. (3 hours)
Pol. Sci. 322. Contemporary Problems. (2 hours)
Pol. Sci. 323. Intergovernmental Relations in the U.S. (3 hours)
*Pol. Sci. 330. Introduction to Public Administration.
Pol. Sci. 350. Government of the Soviet Union and Eastern Europe. (3 hours)
Pol. Sci. 351. Communist Governments and Politics. (3 hours)
Pol. Sci. 355. Government and Politics of United Kingdom and the Commonwealth. (3 hours)
Pol. Sci. 356. Governments of South America. (2 hours)
Pol. Sci. 357. Government and History of Canada. (3 hours)
Pol. Sci. 360. Constitutional Law. (3 hours)
Pol. Sci. 361. Constitutional Law. (3 hours)
Pol. Sci. 365. American Constitutional History. (3 hours)
Pol. Sci. 371. Development of American Foreign Policy. (3 hours)
Pol. Sci. 401. Ancient Political Philosophy. (3 hours)
Pol. Sci. 403. Modern Political Philosophy. (3 hours)
Pol. Sci. 406. American Political Thought. (3 hours)
Pol. Sci. 457. The Military in Government and Politics. (3 hours)
Pol. Sci. 500. Research and Writing in Public Administration. (3 hours)
Pol. Sci. 503. Contemporary Political Philosophy. (3 hours)
Pol. Sci. 510. American Political Problems. (2 hours)
Pol. Sci. 531. Principles of Public Organization and Management. (3 hours)
Pol. Sci. 532. Public Personnel Administration. (3 hours)
Pol. Sci. 533. Budget and Fiscal Administration. (3 hours)
Pol. Sci. 534. State Government and Administration. (3 hours)
Pol. Sci. 353. Municipal Government and Administration. (3 hours)
Pol. Sci. 539. Comparative Public Administration. (3 hours)
Pol. Sci. 563. Administrative Law of the U.S. (3 hours)
Pol. Sci. 690. A,B,C,D. Seminar in Political Theory. (1-3 hours)
Pol. Sci. 691. A,B,C,D. Seminar in Politics. (1-3 hours)
Pol. Sci. 693. Seminar in Public Administration. A,B,C,D.
Pol. Sci. 694. Project in Public Administration.

*Required courses.

Pol. Sci. 696. A,B,C,D. Seminar in Public Law. (1-3 hours)
Pol. Sci. 698. Directed Readings in Political Science. (1-2 hours)
Econ. 311. Income Analysis. (3 hours)
Econ. 312. Price Analysis. (3 hours)
Econ. 430. Economic Development. (3 hours)
Econ. 462. Labor and Public Policy. (3 hours)
Econ. 476. Government and Business. (3 hours)
Econ. 611. Advanced Theory of Income Employment and the Price Level.
Econ. 675. Government Finance. (3 hours)
Engl. 361. Early American Literature. (3 hours)
Engl. 362. Later Nineteenth Century American Literature. (4 hours)
Geog. 441. Political Geography. (3 hours)
Hist. 379. Contemporary American History Since 1920.
Hist. 575. The Early American Republic.
Hist. 679. Readings in Contemporary United States. (2 hours)
Commun. 535. Public Relations. (3 hours)
Psych. 336. Personnel Psychology: Theory and Practice. (3 hours)
Psych. 350. Social Psychology. (3 hours)
Psych. 555. (Sociol.-Psych.) Group Dynamics. (2 hours)
Sociol. 420. Population Problems. (3 hours)
Sociol. 426. Urban Sociology. (3 hours)
*Sociol. 357. Group Relations and Principles of Leadership. (3 hours)
Anthrop. 471. The American Culture. (3 hours)

**PROGRAM C: International Affairs.** Students specializing in this area will be required to have background indicated above plus Pol. Sci. 112 or 115 or their equivalent and take 30 or more hours selected in conjunction with the director of the Institute of Government Service and the student's advisory committee from the following courses or their equivalents:

Pol. Sci. 300. Research and Writing in Political Science. (3 hours)
Pol. Sci. 302. Introduction to Political Philosophy. (3 hours)
Pol. Sci. 310. Parties and Pressure Groups in the U.S. (3 hours)
Pol. Sci. 315. Public Opinion and Propaganda in the U.S. (3 hours)
Pol. Sci. 350. Government of the Soviet Union and Eastern Europe. (3 hours)
Pol. Sci. 351. Communist Governments and Policies. (3 hours)
Pol. Sci. 352. Government and Politics of East Asia. (2 hours)
Pol. Sci. 355. Government and Politics of United Kingdom and the Commonwealth. (3 hours)
Pol. Sci. 356. Governments of South American. (2 hours)
Pol. Sci. 357. Government and History of Canada. (3 hours)
Pol. Sci. 358. Governments and Politics of Southeast Asia. (3 hours)
Pol. Sci. 360. Constitutional Law in the U.S. I. (3 hours)
Pol. Sci. 361. Constitutional Law in the U.S. II. (3 hours)
Pol. Sci. 370. Theory of International Politics. (3 hours)
Pol. Sci. 371. Development of American Foreign Policy. (3 hours)
Pol. Sci. 375. International Organization. (3 hours)
Pol. Sci. 401. Ancient Political Philosophy. (3 hours)
Pol. Sci. 403. Modern Political Philosophy. (3 hours)
Pol. Sci. 406. American Political Thought. (3 hours)
Pol. Sci. 456. Governments and Politics of Mexico and the Caribbean Area. (3 hours)
Pol. Sci. 500. Research and Writing in Public Administration. (3 hours)
Pol. Sci. 531. Principles of Public Organization and Management. (3 hours)
Pol. Sci. 532. Public Personnel Administration. (3 hours)
Pol. Sci. 533. Budget and Fiscal Administration. (3 hours)
Pol. Sci. 538. International Project Administration. (3 hours)
Italian: 101, 102, 201, 301, 431, 432.
Spanish: 101, 102, 201, 301, 311, 321.

*Required courses.

Pol. Sci. 539. Comparative Public Administration. (3 hours)
Pol. Sci. 572. Soviet Foreign Policy. (2 hours)
Pol. Sci. 575. International Law. (5 hours)
Pol. Sci. 580. International Politics of Asia. (3 hours)
Pol. Sci. 690. A,B,C,D. Seminar in Political Theory. (1-3 hours)
Pol. Sci. 691. A,B,C,D. Seminar in Politics. (1-3 hours)
Pol. Sci. 693. A,B,C,D. Seminar in Public Administration. (1-3 hours)
Pol. Sci. 694. Project in Public Administration.
Pol. Sci. 695. A,B,C,D. Seminar in Foreign Governments and Comparative Politics. (1-3 hours)
Psych. 350. Social Psychology. (3 hours)
*Sociol. 357. Group Relations and Principles of Leadership. (3 hours)
Sociol. 420. Population Problems. (3 hours)
Anthrop. 432. Political Institutions of Primitive People. (3 hours)
Anthrop. 471. The American Culture. (3 hours)
Anthrop. 552. Personality, Culture and Society. (3 hours)
Commun. 580. World Communication Channels. (3 hours)
Econ. 241. Comparative Economic Systems. (3 hours)
Econ. 311. Income Analysis. (3 hours)
Econ. 312. Price Analysis. (3 hours)
Econ. 358. International Trade and Finance. (3 hours)
Econ. 415. History of Economic Thought. (3 hours)
Econ. 475. Introduction to Government Finance. (3 hours)
Econ. 630. Advanced Economic Development. (3 hours)
Econ. 635. Economic Problems of Asia. (3 hours)
Econ. 658. International Trade and Finance. (3 hours)
Econ. 675. Government Finance. (3 hours)
Econ. 676. Government and Business. (3 hours)
Engl. 355. World Classics. (3 hours)
Engl. 356. World Classics. (3 hours)
Engl. 450. The Criticism and Appreciation of Literature. (3 hours)
Engl. 572. European Literature of the Renaissance. (3 hours)
Engl. 573. European Literature of the 17th and 18th Centuries. (3 hours)
Engl. 574. European Literature 1760-1850. (3 hours)
Engl. 575. European Literature 1832-1914. (3 hours)
Engl. 582. Shakespeare. (3 hours)
Geog. 441. Political Geography. (3 hours)
Geog. 455. Latin America. (3 hours)
Geog. 552. United States. (2 hours)
Geog. 561. Western Europe and the Mediterranean. (2 hours)
Geog. 562. U.S.S.R. and Its Satellites. (2 hours)
Geog. 571. Problems of Asia. (2 hours)
*Hist. 323. Europe in the Twentieth Century. (2 hours)
Hist. 330. Russia and Eastern Europe Before 1900. (3 hours)
Hist. 331. Russia and Eastern Europe Since 1900. (3 hours)
Hist. 335. England. (3 hours)
*Hist. 340. Asian Civilization. (3 hours)
Hist. 352. Latin America. (3 hours)
Hist. 379. Contemporary American History Since 1920. (3 hours)
Hist. 625. European Diplomatic History since 1815.
Hist. 648. Cultural Asia. (2 hours)
*Hist. 679. Reading in Contemporary United States History. (2 hours)
*Languages. Advanced preparation to develop the foreign language to a level approximating the Foreign Service Requirement.

*Required courses.

The equivalent of the following courses should be taken to be proficient in

French, German or Russian: 101, 102, 201, 211, 301, 311, 321
Chinese, Japanese or French: 101, 102, 201, 301, 321, 322.

# Languages

**Professors:** Rogers (chairman, 326 McK), R. Clark, deJong, Hansen, Lee, Valentine, Watkins, Wilkins.
**Associate Professors:** Anderson, T. Brown, Compton, Folsom, Gibson, Green.
**Assistant Professors:** Ball, Blair, H. Clark, Moon, Speidel.

In addition to the Master of Arts degree in French, German, Latin, Portuguese, Spanish, and Linguistics, the Department of Languages offers a Ph.D. degree in French language and literature, German language and literature, and Spanish language and literature.

### Requirements

It is expected that the graduate student in languages will meet all the general requirements for advanced degrees as outlined by the Graduate School. Special requirements of the Department of Languages are given below.

## Master of Arts Degree

For full graduate standing in French, German, Latin, Portuguese, and Spanish, students must have a B.A. in the language chosen as a major or have an equivalent background. M.A. candidates are expected to have a good reading knowledge of two foreign languages. Provisional admission may be granted only on the recommendation of the department chairman. Minors in these fields must have a fluent reading knowledge of the language elected.

The language major, which consists of a minimum of 19 hours of course work exclusive of the thesis, is in the language and literature of any one of the following languages: French, German, Spanish, Portuguese, or Latin. The minor (minimum of 9 hours of course work) may be in a second language, in linguistics, or in another department, subject to the approval of the advisory committee.

The prerequisites for admission to the M.A. program in linguistics are as follows: Graduate standing; Ling. 325 (or Engl. 321), and Ling. 326; and either high level competence in one foreign language (322 or equivalent) or intermediate level competence in two foreign languages (201 or equivalent). An M.A. candidate will be required to complete 11 hours in Ling. 525, 527, 693, and Engl. 529. A minimum of 5 additional hours may be selected from Ling. 528, 529, 623, 626; Engl. 621, 624; French 521, 522, 692; German 522, 622, 692. and Spanish 521, 522, 692. A graduate minor may be from the fields of anthropology, English, languages, or other fields approved by the Committee on Linguistic Studies.

## Doctor of Philosophy Degree

Departmental requirements for a Ph.D. degree in French language and literature, German language and literature, or Spanish language and literature include the following.

1. **Admission Requirement:** A Bachelor of Arts or a Master of Arts degree.

2. **Residence Requirement:** A minimum of two years after passing the departmental qualifying examination. The last full year (two semesters) of continuous residence must be spent on the B.Y.U. campus, and during that time a minimum of 24 hours of course work in the major field must be completed at this University.

   While it will be possible for a well-prepared student to complete the course work for the Ph.D. degree in three years after receiving the B.A. degree, it should be understood that this minimum time requirement is secondary to other considerations which are explained in the following paragraphs.

3. **Special Examinations:**
   a. **Departmental Qualifying Examination:** To be taken before the beginning of the second year of graduate work.
   b. **Comprehensive Examination:** A student must pass a comprehensive examination on his doctoral fields under the direction of his major department. This examination will be given at the time of completion of all course work.
   c. **Final Oral Examination:** Not later than fifteen days before graduation the student must pass a final examination on his dissertation and applicable subject matter given by a committee of not fewer than five members. The committee consists of the advisory committee, plus such other members as the department chairman and the dean of the Graduate School may designate.

4. **Foreign Languages Required:**
   a. **French Majors:** A reading knowledge of German, Latin, and one other Romance language, in addition to fluent speaking, reading, and writing ability in French.
   b. **German Majors:** A reading knowledge of another modern Germanic language (exclusive of English), Latin, and either French or Spanish, in addition to fluent speaking, reading, and writing ability in German.
   c. **Spanish Majors:** A reading knowledge of German, Latin, and one other Romance language, in addition to fluent speaking, reading, and writing ability in Spanish.

   Reading tests in the languages listed above must be satisfactorily completed before the date of the comprehensive examination.

5. **Course Requirements for the Major:** A minimum of 42 hours of prescribed course work beyond the B.A. degree which will include courses in literature and culture, philology (8 hours) and teaching methodology (2 hours). Additional course requirements will be determined according to the individual needs of the student.

6. **Course Requirements for the Minor:** The minor will consist of 20 hours of approved graduate courses in another language or in a related field if the proposed minor is approved by the graduate faculty of the Department of Languages.

7. **Minimum Reading List Requirement:** All candidates must have an intimate knowledge of both the style and content of the literary works contained in a reading list which will be supplied by the Department of Languages.

## FRENCH

### Courses

**520. French Composition and Grammar.** (2:2:1) — Clark, Lee

**521. Romance Philology.** (2:2:0) — Clark

**522. History of French Language.** (2:2:0) — Clark

**601. Bibliography and Research Techniques.** (2:2:0)

**621. Stylistics.** (2:2:0) — Smithson

Intensive linguistic and literary analysis of French, especially from modern writers: syntax, translation, advanced stylistic analysis, and advanced explication of texts.

**660. Old French Literature.** (3:3:0) — Clark, Slade

**665. French Literature of the Renaissance.** (2:2:0) — Clark, Slade

**670. French Literature of the 17th Century.** (2:2:0) — Brown, Green

**675. French Literature of the 18th Century.** (2:2:0) — Clark

**680. French Literature of the 19th Century.** (3:3:0) Green, Lee, Smithson

**685. French Literature of the 20th Century.** (2:2:0) Ball, Lee

**690, 691. Directed Readings.** (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.
Individual study on a graduate level, to fit the needs of the graduate student.

**692, 693. Seminar in Philology.** (2:2:0 ea.) Clark

**694, 695. Seminar in French Literature.** (2:2:0 ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**721. Romance Dialects.** (3:3:0) Clark

**723. Old French Phonology and Morphology.** (2:2:0) Clark

**741. History of French Poetry.** (2:2:0) Ball, Brown, Clark, Lee

**742. History of French Drama.** (2:2:0) Ball, Brown, Clark, Green, Lee

**744. History of French Novel.** (2:2:0) Ball, Brown, Clark, Lee

**747. French Literary Criticism.** (2:2:0) Clark, Green, Smithson

**761. Medieval Narrative and Lyric Poetry.** (2:2:0) Clark, Slade

**771. Racine, Corneille.** (2:2:0) Brown, Green

**774. Molière.** (2:2:0) Brown, Green

**776. Montesquieu, Voltaire, Rousseau.** (2:2:0) Clark

**781. French Drama of the 19th Century.** (2:2:0) Green, Lee, Smithson

**782. French Novel of the 19th Century, I.** (2:2:0) Green, Smithson

**783. French Novel of the 19th Century, II.** (2:2:0) Green, Lee, Smithson

**786. Modern French Drama.** (2:2:0) Lee

**787. Modern French Novel, I.** (2:2:0) Lee

**788. Modern French Novel, II.** (2:2:0) Ball, Green, Lee

**790, 791. Directed Readings.** (1-2:Arr.:0 ea.) Prerequisite: consent of instructor and committee chairman.

**792. 793. Seminar in Philology.** ..(2:2:0 ea.) Clark

**794, A,B. Seminar in Literature.** (2:2:0 ea.)

**799. Dissertation for the Ph.D. Degree.** (1-6:Arr.:0)

## GERMAN

### Courses

**520. Advanced German Composition and Grammar.** (2:2:0) Prerequisite: German 321 or 322 or consent of instructor.

**522. History of the German Language.** (2:2:0) Prerequisite: three years of college German or its equivalent. Folsom, Watkins

**601. Bibliography and Research Techniques.** (2:2:0) Kelling, Smith

**622. Gothic.** (3:3:0) Watkins

**623. Old High German and Old Saxon.** (3:3:0) Folsom, Watkins

628. **Middle High German I.** (3:3:0) Folsom, Watkins

629. **Middle High German II.** (3:3:0) Folsom, Watkins

681. **German Romanticism.** (2:2:0) Speidel

683. **German Realism.** (2:2:0)

690, 691. **Directed Readings.** (2:Arr.:0: ea.)

692, 693. **Seminar in Philology.** (2:2:0 ea.)
Special problems and topics of relevance in German philology. Topics and instructors to be announced.

694, 695. **Seminar in Literature.** (2:2:0 ea.)
Intensive analysis of a particular writer, a major work or a limited theme. Training in independent literary research. Topic and professor change each semester.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

741. **German Lyric Poetry.** (2:2:0) Kelling

742. **The German Drama to 1880.** (2:2:0) Rogers

743. **The German Drama from 1880 to Present.** (2:2:0) Rogers

744. **The German Novel to 1880.** (2:2:0) Speidel

745. **The German Novel from 1880 to Present.** (2:2:0) Speidel

746. **The German Short Story.** (2:2:0) Smith

776. **Lessing.** (2:2:0) Rogers

777. **Schiller.** (2:2:0) Smith

778. **Goethe.** (2:2:0) Kelling

790, 791. **Directed Readings.** (1-2:Arr.:0 ea.)

792, 793. **Seminar in Philology.** (2:2:0 ea.)
Advanced investigation and analysis of special problems and topics in Germanic philology. Topics and professors will vary.

794, A,B. **Seminar in Literature.** (2:2:0 ea.)
Advanced research and analysis of a limited theme or particular write. Subject will vary. Topic and professor to be announced.

799. **Dissertation for the Ph.D. Degree.** (1-6:Arr.:0)

## LATIN

### Courses

520. **Advanced Composition and Grammar.** (2:2:0) Prerequisite: Latin 322 or equivalent. Clark

561, 562. **Elementary and Advanced Medieval Latin.** (2:2:0 ea.) Prerequisite: Latin 301 or 112 or equivalent. Clark

661. **Cicero.** (3:3:0) Clark

665. **The Latin Historians.** (2:2:0) Clark

671. **Virgil.** (3:3:0) Clark

675. **The Latin Poets.** (3:3:0) Clark
Horace, Ovid, Lucretius, etc.

679. **The Latin Dramatists.** (3:3:0) Clark
Plautus, Terence, etc.

**681, 682. The Latin Fathers.** (3:3:0) Prerequisite: Consent of instructor.

**690, 691. Directed Readings.** (1-2:Arr.:Arr. ea.) Clark
Individual study on a graduate level.

**692, 693. Seminar in Philology.** (2:2:0 ea.) Clark

**694, 695. Seminar in Literature.** (2:2:0 ea.) Clark

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Clark

## PORTUGUESE

### Courses

**521. Romance Philology.** (2:2:0) Clark

**552. Machado de Assis.** (2:2:0) Prerequisites: Portuguese 431 and 432 or equivalent. de Jong
Life and works of Brazil's most prominent writer.

**553. O Modernismo.** (2:2:0) Prerequisites: Portuguese 431 and 432 or equivalent. de Jong
The modern movement in Brazilian Literature (1920-1945).

**620, 621. Portuguese Composition and Conversation.** (3:3:0 ea.) de Jong

**641. Introduction to Portuguese Literature.** (3:3:0) de Jong

**642. Contemporary Portuguese Literature.** (3:3:0) de Jong

**650. Introduction to Brazilian Literature.** (3:3:0) de Jong

**651. Contemporary Brazilian Literature.** (3:3:0) de Jong

**690. Directed Readings.** (1-2:0:Arr.)

**692, 693. Seminar in Philology.** (2:2:0) de Jong

**694. Seminar in Literature.** (1-2:1-2:0)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## SPANISH

### Courses

**520. Advanced Spanish Composition and Grammar.** (2:2:0)

**521. Romance Philology.** (2:2:0) Clark

**522. History of the Spanish Lauguage.** (2:2:0) Gibson

**556. Hispanic-American Poetry.** (3:3:0) Compton, Valentine

**580. Nineteenth Century Spanish Drama and Poetry.** (3:3:0) Prerequisite: Spanish 441 or consent of instructor. Gibson

**581. The Nineteenth Century Spanish Novel.** (3:3:0) Prerequisite: Spanish 441 or consent of instructor. Gibson

**584. Generation of '98.** (3:3:0) Anderson, Moon

**601. Bibliography and Research Techniques.** (2:2:0)

**653. Hispanic-American Drama.** (2:2:0) Valentine

**654. Mexican Novel.** (2:2:0) Compton, Valentine

**655. South American Novel.** (2:2:0) Compton, Valentine

656. **The Modernista Movement.** (2:2:0) Compton, Valentine

657. **Hispanic American Essay.** (2:2:0) Valentine

658. **Hispanic-American Short Story.** (2:2:0) Compton, Valentine

660. **Spanish Medieval Literature.** (2:2:0) Gibson

670. **Golden Age Drama.** (2:2:0) Compton, Gibson, Moon

671. **Golden Age Prose.** (2:2:0) Compton, Gibson, Moon

672. **Golden Age Poetry.** (2:2:0) Compton, Gibson, Moon
Nondramatic.

685, 686. **Twentieth Century Literature.** (2:2:0 ea.) Anderson, Moon

690, 691. **Directed Readings.** (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.
Individual study on a graduate level, to fit the needs of the graduate student.

692, 693. **Seminar in Philology.** (2:2:0 ea.) Clark

694, 695. **Seminar in Spanish Literature.** (2:2:0 ea.)

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

721. **Romance Dialects.** (3:3:0) Clark

741. **The Spanish Poetic Tradition.** (2:2:0)

742. **The Development of Spanish Drama.** (2:2:0)

744. **Spanish Novelistic Prose.** (2:2:0) Moon

773. **Cervantes.** (2:2:0)

774. **Lope de Vega.** (2:2:0)

790, 791. **Directed Readings.** (1-2:Arr.:0 ea.)

792, 793. **Seminar in Philology.** (2:2:0 ea.)

794, A,B. **Seminar in Literature.** (2:2:0 ea.)

799. **Dissertation for the Ph.D. Degree.** (1-6:Arr.:Arr.)

### LINGUISTICS

#### Courses

525. **Descriptive Phonology.** (3:3:0)

## Graduate Department of Library Science

**Professor:** Tyler.
**Associate Professor:** H. T. Johnson( director).
**Assistant Professor:** Knight (assistant director).

The graduate library program provides professional training for the student wishing to obtain a master's degree in library science. Emphasis in this program will be on general preparation, but some elective courses will allow the student to become somewhat specialized in such areas as reader services or in methods of information retrieval. For further information on this see the general catalog.

**Requirements for Admission to the Master's Degree Program:**

Same as general university requirements for graduate study but with a 3.0 grade-point average for the last two years of undergraduate work. At least one foreign language (before graduation) reading knowledge or 12 semester hours of college credit. The special 95, 96 series for graduate students may be used. This should be a modern language such as French, German, Spanish or Russian.

An interview may be requested. Applicant must have taken the G.R.E. (Graduate Record Examination) aptitude and area tests. Some typing ability is highly recommended. Student must give satisfactory evidence of English proficiency. A special course may be required.

**Prerequisite Courses:** 355, 363, 370, and Tchr. Ed. 406.

**Graduation Requirements:** 32 semester hours of which a total of 10 may be in another field. Not more than 9 hours may be accepted as transfer credit. Not more than 6 of this may be counted as graduate credit.

Candidates are expected to maintain a grade-point average of "B" and pass a comprehensive examination before graduation. No thesis is required, but a comprehensive research project is to be completed by each student.

## Courses

☐**Commun. 535. Public Relations.** (3:3:0)

☐**Speech 527. Storytelling.** (2:2:0)

**541. Reader Services.** (3:3:Arr.) F.Su. Knight
Study of the usual services to the reader in all types of libraries, basis of these services, observation of many of them. Community study.

**555. Advanced Cataloging.** (3:3:0) F.Su. Jenson
Review and extension of general descriptive cataloging, classification and subject heading problems. Laboratory assignments using the unabridged Dewey and Library of Congress headings.

**563. School Library Administration.** (3:3:0) F.Su.
The place of the library in the educational program, standards, special problems in personnel, space and equipment, and budget and services. The school library as an instructional materials center.

**569. Reading Guidance for Young People.** (2:2:0) S.Su. Jensen
A critical study of the reading interests and needs of young people. Problems of the reluctant and the avid reader. Extensive examination, discussion, and reading of books.

**570. National, Regional and Subject Bibliography.** (2:2:0) F.S.Su
Characteristics and problems of national bibliographies, becoming familiar with the history and content of such bibliographies and with the techniques of recording materials for availability.

**571. Bibliography of the Sciences.** (3:3:0) S.Su. Johnson

**752. Bibliography of the Humanities.** (3:3:0) F.Su.

**573. Bibliography of the Social Sciences.** (3:3:0) S.Su. Knight

**580-584. Workshop: Current and Special Problems.** (1-2:1-2 wks.: 40-50 hrs. per wk.)

**585. History of the Book.** (2:2:0) S.Su. Flake
Development of printing, bookmaking and libraries from earliest times to the present.

☐**Graduate Education 610. Development of Instructional Materials.** (2:2:1)

**630. Government Publications.** (3:3:0) S.Su.
Intensive study of documents published by federal, state, and local governments and the U.N. with attention to their selection, organization and use in different types of libraries.

**640. Documentation and Information Retrieval.** (3:3:0) S.Su. Johnson
Survey of methods of copying, indexing and retrieving information with emphasis on systems using machine search.

**650. Current Problems in the Technical Services.** (2:2:0) Su.
General review of the technical processes emphasizing individual problems encountered in school and public libraries.

**663. Library Administration and Management.** (3:3:0) S.Su.
Principles of good administration and management in public and academic libraries. Such things as personnel, finance, buildings and equipment, line of authority, etc. will be considered.

**679. Patterns and Problems of Adult Readers.** (3:3:0) F.Su.
Reading interests and habits of adults, survey of studies, materials for various types of readers, reader guidance, reader's advisory service, and role of the library in adult education.

**690. Field Seminar.** (3:3:2½) S.Su. Johnson
Reports and discussion concerned with fieldwork. Problem recognition and solving in library organization, services, and management.

**695, 696. Independent Readings in Library Science.** (1-2:Arr.:Arr. ea.) F.S.Su. Johnson

**698. Research in Library Science.** (2:2:0) S.Su. Johnson
Research on a specific problem in the library field.

# Mathematics

**Professors:** Fletcher, Robinson.
**Associate Professors:** Fearnley, Hillam (chairman, 46 T-15), Yearout.
**Assistant Professors:** Burton, Egbert, Gee, Gill, Higgins, Jamison, Larsen, Moore, Peterson, Skarda.

The Department of Mathematics offers courses leading to the degree of Master of Science in Mathematics and Master of Science in Mathematics Education.

## Master of Science in Mathematics

This degree represents training in preparation (1) for additional study and research in mathematics at the Ph.D. level, (2) for employment in industry or government, (3) for teaching in junior colleges.

### Prerequisites

A student must present credit at least equivalent to the requirements for a B.S. degree in mathematics at Brigham Young University, including six hours of advanced calculus, before being admitted on a degree-seeking basis.

### Graduation Requirements

A graduate student should acquaint himself with the general Graduate School regulations.

**Option I.** A candidate selecting this option is required to complete a minimum of 18 semester hours in approved graduate mathematics and is also required

to complete an acceptable thesis. In addition, at least 9 semester hours in a minor field approved by the Department of Mathematics must be completed.

**Option II.** A candidate selecting this option is required to complete a minimum of 12 semester hours in approved graduate courses in one of the general areas: algebra, analysis, applied mathematics, or topology. In addition a minimum of 12 additional hours must be completed in courses selected from the remaining three areas, and an acceptable thesis must be presented.

The candidate's program must have prior approval from the department and must be filed with the graduate dean prior to registering for the last 15 semester hours of credit applying toward the degree.

## Master of Science in Mathematics Education

This degree provides for a major in mathematics and a minor in education. The program is designed to give adequate preparation for teaching in secondary schools, or, perhaps, in junior colleges.

### Prerequisites

To be admitted on a degree-seeking basis a student must present:

1. A baccalaureate degree in mathematics or in education with a teaching major in mathematics. The candidate must either have taken course work equivalent to the present requirements for a teaching major in mathematics. (Any deficiency must be removed before beginning the graduate program.) State certification requirements must be met in the undergraduate program or supplementary to the graduate program.
2. A course in the philosophy of science such as Physics 300 or Phil. 473.
3. Formal acceptance into the program by the Department of Mathematics.

### Graduation Requirements

A graduate student should acquaint himself with the general Graduate School regulations. A candidate is required to complete:

1. Math. 371, 372, 501, 502, 503. Students who have had Math. 371 or 372 should elect an additional graduate mathematics sequence. With special permission certain other undergraduate courses may be elected (e.g., Math. 332, 387, 451) provided these were not part of the undergraduate preparation.
2. One of Math. 541 and 542, Math. 551 and 552, or any 600 level sequence in mathematics.
3. An acceptable thesis, which many be expository.

### Courses

**332. Introduction to Complex Analysis.** (3:3:0) F.S.Su. (m) Prerequisite: Math. 244, or 113.

**371. Introduction to Modern Algebra.** (3:3:0) F.S.Su. (m) Prerequisite: Math. 142, or 113.

**372. Introduction to Linear Algebra.** (3:3:0) S. (m) Prerequisite: Math. 142, or 113.

**387. Theory of Numbers.** (3:3:0) F. (m) Prerequisite: Math. 142 or 113.

**451. Modern Geometry.** (3:3:0) F. (m) Prerequisite: Math. 372.

**501, 502. Foundations of Mathematical Thought.** (3:3:0 ea.) F.S.
Analysis of the axiomatic method, set theory, the axiom of choice, mathematics as an extension of logic, paradoxes, intuitionism and formalism. For majors in mathematics education.

503. **Mathematics for Secondary School Teachers.** (3:3:0) (Offered on demand) Prerequisite: teaching experience or consent of instructor.

Emphasis given to the newer materials and trends in teaching mathematics in the secondary schools. For in-service teachers or mathematics education graduate students.

513, A,B,C,D. **Advanced Topics in Applied Mathematics.** (3:3:0 ea.) (Offered on demand) (m) Prerequisite: consent of instructor.

Specialized topics selected from integral equations, boolean algebra, in formation theory, group representations, calculus of variations, etc. varied from time to time.

541, 542. **Advanced Calculus.** (3:3:0 ea.) F.S. (m) Prerequisite: Math. 244 or 323.

Includes a rigorous treatment of continuity, differentiability and Riemann integration of functions of one and several real variables and a development of infinite series.

545. **Special Topics in Analysis.** (3:3:0) (Offered on demand) Prerequisite: consent of instructor.

551, 552. **Introduction to Topology.** (3:3:0 ea.) F.S. (m) Prerequisite: completion or concurrent registration in Math. 541.

An axiomatic treatment of linearly ordered spaces including properties of closed sets, connected sets, and separable sets, elementary plane topology, matrization, application to analysis.

555. **Special Topics in Topology.** (3:3:0) (Offered on demand) Prerequisite: consent of instructor.

575. **Special Topics in Algebra.** (3:3:0) (Offered on demand) (m) Prerequisite: consent of instructor.

585. **Matrix Analysis.** (3:3:0) (Offered on demand) (m) Prerequisite: Math. 372. or 322.

An introduction to matrix analysis, including the study of characteristic values, canonical forms, and functions of matrices, with applications.

591, 592. **Senior Seminar in Mathematics.** (1:1:0 ea.) F.S.

A seminar for senior or graduate majors in mathematics.

617, 618. **Mathematical Physics.** (3:3:0 ea.) F.S. Prerequisite: Math. 436 or 323; Recommended: Math. 542.

Evaluation of integrals, integral transforms, vectors, special functions, partial differential equations, perturbation theory, integral equations, calculus of variations, tensor analysis.

631, 632. **Complex Analysis.** (3:3:0 ea.) (Offered 1966-67 and alternate years) Prerequisite: Math. 332. Recommended: Math. 542.

Complex numbers, derivatives and integrals of holomorphic functions, Cauchy integral theorem and formulas, Taylor and Laurent expansions, analytic continuation, singularities, residues, conformal mapping.

634, 635. **Theory of Ordinary Differential Equations.** (3:3:0 ea.) (Offered 1967-68 and alternate years) Prerequisite: Math 435. Recommended: Math 542.

Includes existence and uniqueness of solutions, linear systems, self-adjoint eigenvalue problems, oscillation and comparison theorems and asymptotic behavior of nonlinear systems: stability.

641, 642. **Functions of a Real Variable.** (3:3:0 ea.) (Offered 1967-68 and alternate years) Prerequisite: Math. 542.

Point sets, measures, measurable functions, Lebesques integration, Stieltjes integration, absolute continuity.

**647, 648. Partial Differential Equations.** (3:3:0 ea.) (Offered 1966-67 and alternate years) Prerequisite: Math. 436. Recommended: Math. 542.
General solutions, existence, uniqueness and stability of standard equations, transforms, separable coordinate systems, special techniques, numerical solutions.

**651, 652. General Topology I, II.** (3:3:0 ea.) (Offered 1967-68 and alternate years) Prerequisite: consent of instructor.
Abstract topological spaces, imbedding and matrization, study of special continua, local connectedness and indecomposable continua, introduction to the theory of manifolds including elementary homotopy and homology properties of manifolds.

**671, 672. Modern Algebra.** (3:3:0 ea.) (Offered 1966-67 and alternate years) Prerequisite: Math. 372.
Mappings, semi-groups and groups, rings, integral domains, fields, ring extensions, groups with operators, modules and ideals, lattices and boolean algebra.

**681, 682. Linear Algebra.** (3:3:0 ea.) (Offered 1966-67 and alternate years) Prerequisite: Math. 372.
Finite dimensional vector spaces over a division ring, linear transformations, bilinear forms, euclidean and unitary spaces, cartesian product spaces, tensor spaces, infinite dimensional vector spaces.

**695. Reading in Mathmatics.** (1-2:1-2:0) )Offered on demand)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Mechanical Engineering Science

**(Including Aeronautical and Astronautical Engineering)**

**Professors:** Simonsen, Ulrich*.
**Associate Professor:** Cannon.
**Assistant Professors:** Heaton, Wille (chairman, 273 ELB).
*On leave.

The areas of graduate study in mechanical engineering are: thermodynamics, heat transfer, gas dynamics, machine design, stress analysis, vibrations, and automatic controls.

### Requirements for Entrance

A student working toward a graduate degree in mechanical engineering science should have completed a bachelor's degree (or its equivalent) in mechanical engineering. A student without adequate background will be required to make up the deficiency. A course in differential equations is the minimum mathematics background acceptable.

### Degree Requirements

Master's candidates are required to fulfill the general University M.S. requirements including a minimum of six hours of mathematics beyond that required for a B.Y.U. bachelor's degree. A minimum of six and a maximum of nine hours of thesis credit may be used to fulfull M.S. degree requirements.

The following interdepartmental courses may be used as major courses in the Mechanical Engineering Department. They are administered and taught jointly by the Civil Engineering Science and Mechanical Engineering Science Department faculties.

### Courses

□**C.E. 501. Advanced Mechanics of Materials I.** (3:3:0) (Interdepartmental) Arr. Prerequisite: C.E. 303.

□C.E. 502. **Advanced Properties of Materials I.** (3:3:0) (Interdepartmental) Prerequisite: C.E. 305 or equivalent.

511. **Intermediate Gas Dynamics.** (3:3:0) Arr. Prerequisite: M.E. 413.
Introduction to compressible flow in two and three dimensions including the linearization of the potential equations, small perturbation theory. Method of characteristics and oblique shocks.

512. **Boundary Layer Theory.** (3:3:0) Arr. Prerequisite: M.E. 413.
A study of the fluid mechanics of the boundary layer with particular emphasis on the laminar flow, Navier-Stokes equations, Prandtl's equations, etc.

521. **Advanced Thermodynamics.** (3:3:0) Arr. Prerequisite: Math 322.
Extended treatment of the fundamentals of thermodynamics including transient conditions, equilibrium and current topics.

522. **Combustion.** (3:3:0) Arr. Prerequisite: M.E. 322.
Mass balance and chemical structure, chemical equilibrium and kinetics as applied to combustion; burning models, solids, liquid and gaseous. Deflagration and detonation type burning, properties of fuels and combustion hardware.

531. **Principles of Automatic Control.** (3:3:0) Arr. Prerequisites: Math. 322, 323; M.E. 412.
Transfer functions applied to mechanical, hydraulic, pneumatic, and electrical components, and their combination. Block diagrams, Nyquist and Routh Criteria, Bode's and Root Locus Plots, Integral and error rate compensation. Nonlinear systems.

533. **Stress Analysis of Aerospace Structures.** (3:3:0) Prerequisite: C.E. 501, or consent of instructor.
Particular emphasis is given to analysis of aircraft and missile type structures; buckling of columns and compression panels; shear and tension field panels; curved beams and rings; and semimonocoque structures.

535. **Advanced Vibration Analysis.** (3:3:0) Prerequisite: M.E. 435.
Vibration characteristics of systems with multiple degrees of freedom; vibrational modes of elastic bodies; random vibrations; and simple nonlinear systems.

537. **Advanced Kinematics.** (3:3:0) Prerequisite: M.E. 431.
Geometry of constrained motion, with application to point paths; kinematic synthesis; and types of mechanisms.

541. **Advanced Heat Transmission.** (3:3:0) Arr. Prerequisite: M.E. 441.
Extension of M.E. 441 to include numerical and approximate methods of solution, transient problems, and solution of problems by analogy methods.

552. **Mechanical Engineering Materials.** (3:3:0) Prerequisite: C.E. 502 or consent of instructor.
Content to be of an applied nature; applied metallurgy, design for fatigue, stress concentration in machine members, residual stress and current topics.

554. **Advanced Manufacturing Processes.** (3:3:0) Arr. Prerequisite: M.E. 351.
Basic analysis of forming, machining, welding, and casting processes with emphasis on microstructures. Selection of process parameters with consideration of economics and material properties.

581. **Internal Combustion Engines.** (3:2:3) Arr. Prerequisite: M.E. 422.
Basic principles; theoretical and actual cycles; performance characteristics with experimental laboratory analysis.

583. **Principles of Turbomachinery.** (2:2:0) Arr. Prerequisites: M.E. 331, 412.
Analysis and design of all types of turbomachinery.

**585. Jet Propulsion Power Plants.** (3:3:0) Arr. Prerequisites: M.E. 413, 412.
Analysis of jet propulsion power plants including performance, economics, and matching components.

**591, 592. Seminar.** (1:1:0 ea.) Prerequisite: fifth year standing.
Student and faculty presentation of topics of special and current interest.

**595, 596. Special Problems.** Prerequisite: consent of department chairman.

**611. Theories of Fluid Turbulence.** (3:3:0) Prerequisite M.E. 413 or consent of instructor.
General fluid equations, the Navier-Stokes equations separated by the linear fluctuation assumption and time averaged. Current approximate solutions to integral forms of the equations, methods of turbulence measurement, linear stability theory and transition and turbulence models. Particular attention is paid to the physical significance of the mathematics.

**612. Theoretical Hydrodynamics.** (3:3:0) Prerequisites: M.E. 413, Math.322 or Math. 323.
A study of Euler's equation, transforms, and potential theory. Primary emphasis on irrotational flow.

**621, 622. Thermodynamics Theory I, II.** (3:Arr.:Arr. ea.) Arr.
Brief review of zeroth, first and second laws of thermodynamics. Criteria for equilibrium, meta stable equilibrium, additional unsteady state problems, third law, statistical approach, irreversible thermodynamics, and current topics from literature.

**631. Mechanical Control Systems.** (3:3:0) Prerequisite: M.E. 531.
Application of fundamental theory and practical hardware to specific problems in hydraulic, pneumatic and mechanical systems. Advanced techniques for analyzing nonlinearities which arise in practice are presented.

**635. Advanced Vibration Analysis II.** (3:Arr.:Arr.) Prerequisite: M.E. 535.
Advanced linear vibration theory with special emphasis on approximate methods of analysis of complex systems and topics in nonlinear vibration theory. Includes application of advanced theory to problems of current interest.

**637. Advanced Dynamics of Mechanical Elements.** (3:3:0) Prerequisites: Math. 322, 323; M.E. 435.
Application of methods of advanced dynamics to problems associated with mechanical hardware and systems. Applications of Euler's equations, LaGrange's equations, and Hamilton's principle, and stresses caused by dynamic loads.

**641, 642. Heat Transfer Theory I, II.** (3:3:0 ea.) Prerequisite: M.E. 441.
Analytic study of conduction, convection and radiation heat transfer. Topics include steady state conduction, transient conduction, conduction with generation, convective heat transfer over a flat plate and within a duct with fully developed and developing flow, aerodynamic heating, solid and gaseous radiation, combined radiation and convection, convective heat transfer with mass transfer and other topics of current interest.

**661, 662. Elasticity in Engineering.** (3:Arr.:Arr. ea.) Arr.
Fundamental concepts of elasticity theory. Equations of stress equilibrium and strain compatibility. Solution of two-dimensional problems. Photoelastic method of stress measurements. Analysis of stress and strain in three dimensions. Solution of torsion problems. Wave propagation in elastic solids. Particular emphasis is placed upon application to machine design such as stress in bearings, contact stress in machine elements, pressure vessels and thermal stresses. Approximations to the exact theory for specific applications are discussed in detail.

**697. Research for Master's Degree.** Arr.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Arr.

# Music

**Professors:** Gates (chairman, C-550 HFAC), Davis, Earl, Goodman, Halliday, Sardoni.
**Associate Professors:** H. Laycock, R. Laycock, Nordgren, Woodward.
**Assistant Professors:** Bradshaw, Cannon, Williams.

The Department of Music offers graduate programs leading to the Master of Music, Master of Arts, and Doctor of Philosophy degrees. The master's degrees are in perparation for (1) further study and research at the doctoral level, (2) teaching and/or supervision at the elementary, secondary, junior college levels, and in private studios, (3) performance and composition, (4) background in the many related fields such as community recreation, therapy, church music, merchandizing, broadcasting, and music criticism. The doctoral degree is in preparation for university or conservatory teaching and research, performance or composition.

Full graduate standing is granted to students who.

1. Meet the general regulations as outlined by the Graduate School.
2. Possess the baccalaureate degree with a major in music.
3. Have at least a "B" average in the last two years of college work.
4. Pass the Music Department graduate entrance examination (preferably prior to the first registration but at least prior to the second registration). A student may not take classes in which the examination shows him deficient until such deficiencies have been made up. This examination (which presupposes the information and skills of Music 292, 484, and 485, or their equivalents) is normally given each semester on the day preceding registration (excluding Sunday).

Provisional standing may be recommended for a student who has not completed the above general requirements or the specific requirements listed below. Deficiencies in background must be made up, however, before full standing will be recommended.

Candidates for an advanced degree in music education (elementary or secondary) must have completed the general certification requirements or equivalent. Students wishing to take an advanced degree with a major in music theory should possess a baccalaureate degree with a major in music theory or its equivalent. Candidates for an advanced degree in musicology should possess a baccalaureate degree with a major in music theory or its equivalent and should possess a reading knowledge of at least one foreign language, preferably French or German.

### Master's Degree

The basic requirements for the master's degree in music are the same as the general Graduate School requirements. Both Option I and Option II are available. Approved fields for study are music education, music theory, musicology, and applied music (available as a minor field only). Special departmental requirements for the master's degree are as follows:

**Music Education:** Mus. 605, 610, 612, 613, 635, and 693.
**Music Theory:** Mus. 613, 635, 686, and 693.
**Musicology:** Mus. 613, 635, 637, 638, 639, 675, and 693.

### Master of Music Degree

For qualified students whose interests lie principally in performance, the Department of Music offers a program leading to the Master of Music degree in piano, voice, or organ. The requirements are as follows:

1. In addition to the admission requirements of the Graduate School, the candidate must pass the Music Department Graduate Entrance Examination and audition before the faculty of the major instrument

area. (Provisional admission is possible until the entrance exam is completed. Deficiencies in the performance area, as revealed in the audition, must be made up during the first semester in the program.) A bachelor's degree in applied music or its equivalent is prerequisite to admission.

2. The course work is supervised by the advisory committee. Required courses are:

   **Performance:** 10-14 hours.
   Mus. 660p.
   Mus. 566, 567 (four hours beyond bachelor's degree program).
   Mus. 697 (Recital).

   **Research:** 7 hours.
   Mus. 635.
   Mus. 693.
   Mus. 697 (Paper).

   **Other:** 6 hours.
   Mus. 613.
   Mus. 639.

   **Electives:** 5-9 hours.
   A minimum of 32 hours is required for the degree.

3. The courses in performance and research both culminate in the recital (Mus. 697). A research paper on specific aspects of selected literature from the recital must be presented with the recital. At the beginning of the final semester (or earlier) the candidate must pass a repertoire examination in which he may be expected to demonstrate, in response to the directions and questions of the examining committee, the depth of his knowledge of the standard literature for his instrument. At this time the candidate proposes the program for the recital and the subject of his paper.

   At least three weeks before the public presentation of the recital, the candidate will perform the recital and defend his paper before a jury made up of graduate faculty members from his major area of study. During the final three weeks he will make any adjustments deemed necessary by the jury.

   The final public presentation of the recital must be attended by the jury. The research paper must be filed with the Graduate School in the same manner as a regular thesis.

### Doctor's Degree

The doctoral program in music is flexible and is designed to meet each candidate's needs. It offers optional emphasis in the areas of music education, music theory, and musicology. The Ph.D. curriculum in music includes a total of 80-82 hours of approved course work and research beyond the baccalaureate degree as follows:

1. A core program of 31 semester hours of advanced study in music which provides the framework and basic techniques for systematic learning and research in any area of music. This core consists of the following courses: Mus. 605, 613, 635, 637, 638, 639, 652, 675, 754, 785.
   (Music Education majors may substitute Art 501 or other courses in Aesthetics for Mus. 652.)

2. A major area of emphasis (music education, music theory, or musicology) of 36 hours to be prescribed by the advisory committee, but which will include Mus. 693, 699, (or equivalent), 794 (6 hours), and the writing of an acceptable dissertation based on original research (Mus. 799, 12 hours credit). Mus. 686 is also required for students whose emphasis is in music theory.

3. A minor of 13 to 15 semester hours.

A student desiring to pursue the Ph.D. program must pass the department doctoral admissions examination during the first semester of work following the master's degree or by the time he has accumulated approximately forty-five semester hours beyond the baccalaureate degree.

## Courses

537x. **Music for Elementary School Teachers (Advanced).** (2:2:0) Home Study only. Prerequisites: Mus. 102, 237. Groesbeck
Experiences in teaching and various music activities in the elementary school.

565. **Piano Pedagogy.** (2:2:0) S. Prerequisite: advanced standing as a pianist. Methods, materials, and problems in teaching piano. Keeler

566, 567. **Applied Music Literature.** (2:2:0) F.S.Su. Prerequisite: senior standing as an applied music major. Belnap, Keeler, Pollei, Weinzinger, Woodward
Intensive study of literature for the major instrument taken by senior and graduate students in applied music with sections of voice, piano, and organ.

568. **Vocal Pedagogy.** (2:2:0) S.Su. Prerequisite: advanced ability as a singer. Halliday

569. **Organ Pedagoy.** (2:2:0) S. Prerequisite: Mus. 468. Keeler

583. **Acoustics of Music.** (3:3:0) S. (Offered 1967-68 and alternate years) Prerequisite: Mus. 292. D. Monson

587, 588. **Composition.** (3:3:0) F.S.Su. Prerequisite: Mus. 292. Bradshaw, Gates

601. **Music in the Elementary School.** (2:2:0) F.Su. Prerequisites: Mus. 237 and the equivalent of an elementary education teaching minor in music. Davis, Groesbeck

603. **Music in the Junior High School.** (2:2:0) S.Su. Prerequisite: Mus. 237 or equivalent. Davis, Goodman

605. **Influence of Music on Behavior.** (3:3:0) F.Su. Prerequisite: general psychology, sociology, or equivalent. Goodman

610. **Supervision and Administration of Music in the Public Schools.** (2:2:0) S. Su. Goodman

612. **Music Education in Society.** (3:3:0) S.Su. Prerequisites: Mus. 484, 485, or equivalent. Goodman

613. **Basic Concepts in Music Education.** (2:2:0) F.Su. Goodman
Required of all candidates for graduate music degrees.

615. **Vocal Methods, Materials, and Resources.** (2:2:0) F.Su. Prerequisite: Mus. 479 or equivalent. Halliday, Woodward

616. **Instrumental Methods, Materials, and Resources.** (2:2:0) S.Su. Prerequisite: Mus. 479 or equivalent. Goodman, H. Laycock

620. **Advanced Instrumental Conducting.** (2:3:3) F.Su. Prerequisites: Mus. 292, 374, 375, 485 or equivalent. R. Laycock, Sardoni

621. **Advanced Choral Conducting.** (2:3:3) S.Su. Prerequisites: Mus. 166, 292, 364, 374, 375, 485 or equivalent. Earl, Halliday, R. Woodward

625. **Summer Music Clinic.** (2:4:4) (Two weeks during clinic) Su.
May be counted as either music education or applied music.

630. **A,B,C. Special Lectures in Music Education** (2:2:0 ea.)

635. **Musical Research Techniques.** (3:3:0) F.Su. Prerequisite: graduate standing or consent of instructor. Cannon, Earl
Required of all candidates for graduate music degrees.

**637. Medieval and Renaissance Music.** (4:4:0) F.Su. Prerequisites: Mus. 484 and 485, or equivalent. Cannon

**638. Music of the Baroque Period.** (3:3:0) S.Su. Prerequisites: Mus. 484 and 485, or equivalent. Cannon, Wakefield

**639. Classic and Romantic Music.** (4:4:0) F.Su. Prerequisites: Mus. 484 and 485, or equivalent. Cannon, Wakefield

**641. Special Lectures in Musicology.** (3:3:0) F.S.Su. Prerequisites Mus. 484 and 485, or equivalent.

**648. Collegium Musicum.** (1:0:3) F.S. Prerequisite: consent of director. R. Laycock

Practical experience in designing programs, outlining music, and preparing notes of music from the medieval to modern times.

**652. History of Notation and Paleography.** (3:3:0) F. (Offered 1867-68 and alternate years) Prerequisites: 484, 485, and 637, or equivalent. Cannon

**656. Hymnology.** (2:2:0) S. Prerequisites: Music 484, 485, or equivalent. Earl

**660p. Graduate Applied Instruction.** (2:1:0) F.S.Su. Prerequisites: completion of undergraduate applied proficiency requirements and audition.

Fifteen ½-hour lessons per semester. Two to three hours practice required per day.

**663. Solo Recital.** (2:1:0) F.S.Su. Prerequisite: permission of graduate applied faculty. Bradshaw

One period per week with private teachers, 2-3 hours practice per day plus public performance of the recital. Required of all graduate students minoring in applied music.

**673. Advanced Problems in Musical Structure.** (3:3:0) F.Su. Prerequisites: Mus. 491 and 472. Bradshaw

**675. Materials of Modern Music.** (3:3:0) S.Su. Prerequisite: Mus. 491. Bradshaw, Gates

**686. Pedogogy of Music Theory.** (3:3:0) F.Su. Prerequisite: Mus. 292. Nordgren

**687, 688. Composition.** (3:3:0 ea.) F.S.Su. Prerequisite: Mus. 588 or equivalent. Bradshaw, Gates

**693. Pro-Seminar in Music.** (2:2:0) S.Su. Prerequisites: Mus. 484, 485 and 635, or equivalent, and approval of advisory committee. Cannon, Goodman, H. Laycock

Required of all candidates for graduate music degrees.

**694, A,B. Independent Readings.** (2:0:6 ea.) F.S.Su. Prerequisite: Mus. 693 or equivalent. Cannon, Goodman, H. Laycock

**697. Recital for Master of Music Degree.** (4:Arr.:Arr.) Prerequisite: approval of advisory committee and graduate music faculty. Belnap, Bradshaw, Halliday, Keeler, Pollei, Smith, Woodward

**698. Composition for Master's Degree.** (2-6:Arr.:Arr.) F.S.Su. Prerequisite: approval of the Music Department Graduate Committee based upon evidence of ability in composition as manifested in a preliminary work. Bradshaw, Gates

To be submitted in lieu of a thesis by candidates for the master's degree majoring in composition.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Prerequisite: approval of Music Department Graduate Committee.

Candidates for the master's degree are required to show competence in writing and research before work is begun on the thesis.

753. **Advanced Problems in Notation.** (3:3:0) S. (Offered 1966-67 and alternate years) Prerequisite: Mus. 652. Cannon

754. **History of Musical Instruments.** (3:3:0) F. (Offered 1967-68 and alternate years) Prerequisite: Mus. 484 and 485, or equivalent. Wakefield

785. **Historical Aspects of Music Theory.** (3:3:0) S. (Offered 1966-67 and alternate years) Prerequisite: Mus. 292. Nordgren

794. **Seminar in Music.** (3:3:0) F.S. Prerequisites: Mus. 693 and approval of graduate advisory committee. Cannon, Goodman, H. Laycock

799. **Dissertation for the Ph.D. Degree.** F.S.Su. Prerequisite: approval of the Music Department Graduate Committee.
Candidates for the Doctor of Philosophy degree are required to show competence in writing and research before work is begun on the dissertation.

# Philosophy

**Professors:** Riddle (coordinator, 123 JS), Madsen, Yarn.
**Associate Professors:** Horsley, Patch.

(An interdepartmental area only)

A graduate minor in philosophy may be obtained by following a course of study and class work as approved by the person representing philosophy on the student's advisory committee. A minimum of 9 hours of course work including at least one seminar will be required on the master's level. A minimum of 15 hours of course work including at least two seminars will be required on the doctoral level. The normal prerequisite for a graduate minor in this area is an undergraduate minor in philosophy.
No major is offered in philosophy.

## Courses

380. **Survey of Philosophy.** (2:2:0) F.S.Su.
Introduction to types, fields, and problems of philosophy.

381. **Deductive Logic.** (2:2:0) F.Su. Riddle
Formal aspects of language and deductive logic.

382. **Inductive Procedures.** (2:2:0) S. Riddle
Scientific methods.

385. **Ethics: Plato to Dewey.** (2:2:0) F.Su. Patch, Yarn
An historical approach to the major ethical theories of the western world.

386. **Introduction to Philosophy of Religion.** (2:2:0) F. Madsen, Yarn
A comparative study of major assumptions in religious thought.

470. **History of Ancient Philosophy.** (3:3:0) F.Su. Yarn
Western philosophy from the 6th century B.C. to the 14th century A.D.

471. **History of Modern Philosophy.** (3:3:0) S.Su. Yarn
Western philosophy from the 15th century to the 19th century.

472. **Contemporary Ethics.** (2:2:0) S.Su. Madsen, Patch
Examination of the meaning and function of moral judgments and the bases of ethical commitment.

473. **Philosophy of Science.** (2:2:0) Riddle
Examination of the conceptual framework of modern science.

**474. Types of Religious Philosophy.** (2:2:0) F. Madsen, Yarn
Survey of philosophical bases of Christian religion.

**475. Contemporary Anglo-American Philosophy.** (2:2:0) F.S.Su. Madsen
Men and movements in naturalism and logical positivism.

**476. Contemporary Continental Philosophy.** (2:2:0) F.S.Su. Madsen
20th century developments in existentialism, phenomenology, and Marxism.

**477. Scholasticism, Humanism, Mysticism.** (2:2:0) F.S.Su. Horsley

**483. Problems of Knowledge.** (2:2:0) F. Riddle
Analysis of how experience becomes knowledge.

**498. Readings in Philosophy.** (1-2:1-2:0) F.S.Su.

**591. Seminar: Philosophical Analysis.** (2:2:0) Riddle

**592A. Seminar in the History of Philosophy: Ancient Medieval.** (2:2:0) S.Su. Prerequisite: Philosophy 470. Yarn

**592B. Seminar in the History of Philosophy: Modern.** (2:2:0) S.Su. Prerequisite: Philosophy 471. Yarn

**593. Seminar: Philosophy of Religion.** (2:2:0) S.Su. Madsen

**594. Seminar: Philosophy of Science.** (2:2:0) Riddle

**688. Readings in Philosophy.** (1-4:1-4:0) F.S.Su.

# Physical Education for Men
# Physical Education for Women

**Professors:** Geddes (chairman - men, 266 SFH), Holbrook (chairman - women, 296 RB), Hart, Hartvigsen, Kimball, Neilson.
**Associate Professors:** Bangerter, Jensen, Roundy, Soffe.

### Degrees

The Department of Physical Education offers the degree of Master of Arts or Master of Science.

**The Master of Arts Degree**

The Master of Arts degree is awarded to those involved with artistic creativity, philosophical and historical methods, and evaluative studies.

The field of physical education calls upon varying skills and abilities. The breadth of the field calls for individuals to serve in varying capacities. They develop individual, school or community projects. They employ artistic and creative methods, they plan events and exert leadership, and they pursue historical, philosophical, interpretative and evaluative studies. According to the interest and the aptitude of the student, he thus selects either a project or a thesis in partial fulfillment of the requirements for the Master of Arts degree.

**Project:** The project is an application of practical research, artistic performance, creative endeavor or effective planning and leadership. The student works with his advisory committee gaining all approvals and providing final reports which parallel the thesis both in form and in quality.

**Thesis:** The research is conducted and reported in the approved manner and thesis form.

**The Master of Science Degree**

The Master of Science degree is awarded to those concerned with scientific methods in observational or controlled experimental study and research in which

prediction, relationships, verification and the orderly processes of science are pursued. The field of physical education recognizes the contributions of those who do research in physiology, movement, kinesiology and "sports medicine." These areas are concerned with scientific methods consisting of primary emphasis on controlled observation, experimentation, quantification, verification, prediction, and the rational ordering of facts and principles resulting from such pursuits.

**Thesis:** The research is conducted and reported in the approved manner and thesis form.

### Requirements

The student must satisfy the following requirements:

1. Meet all basic general requirements for the master's degree as outlined by the Graduate School.
2. Receive official acceptance by the department chairman.
3. Have completed the baccalaureate degree with a major in physical education or its equivalent. All major undergraduate courses as required at Brigham Young University, or their equivalency, to be satisfied before the candidate will be accepted on a degree-seeking basis.
4. Successfully pass a general proficiency examination demonstrating competency and sound knowledge of subject matter as covered in the undergraduate degree. Results of the examination to be used by the advisory committee for guidance in the selection of courses and studies leading to the master's degree.
5. Successfully complete among others the following department graduate courses: 601, 662, and 692.
6. Complete a minimum of 30 semester hours of credit in a combination of major and minor or a major with supporting fields. A suggested apportionment of the credit is indicated:

| Major-Minor | Major and Supporting Fields |
|---|---|
| 15 hours major | 18 hours major |
| 9 hours minor | 6 hours two supporting fields |
| 6 hours thesis or projects and electives | 6 hours thesis or project and electives |
| 30 Total | 30 Total |

7. Submit a thesis or project done under the direction of a committee composed of representatives from the major and minor fields. The thesis or project format must conform with standards for written work as recommended by the Graduate School.
8. Perform satisfactorily in a final oral examination on the thesis or project and the professional subject matter area.

The responsibility of knowing and fulfilling Graduate School and department regulations and requirements for the master's degree rests with the student.

### Courses

571. **Teaching Progression in Team Sports.** (Men) (2:1:2)

575. **Materials and Methods for Secondary Teachers.** (2:1:2) F. Hirst

588. **Worshop in Modern Dance.** (2:2:6)

600. **Curriculum Construction and Supervision in Physical Education.** (3:3:0) S. Hart
Curriculum construction for elementary, secondary, and college physical education with techniques of supervision in improving teacher-student learning situations.

601. **Problems in Physical Education.** (3:3:0) F.S. Bangerter
Identification and interpretation of the nine generalized problems in physical education.

**610. Philosophy of Physical Education.** (2:2:0) F.S. Holbrook
Interpretations, beliefs, and concepts underlying the profession of physical education.

**631. Problems in Athletic Conditioning.** (2:2:0) F.S. Prerequisite: Zool. 264. Call
Application of scientific principles to problems in athletic conditioning.

**635. Measurement and Evaluation in Physical Education and Health Education.** (3:3:0) S. Prerequisite: P.E. 464 or equivalent. Hart

**640. Curriculum Construction in Physical Education.** (2:2:0) S. Hart
Curriculum problems for elementary, secondary, and college physical education programs.

**642. Mechanical Analysis of Activities.** (2:2:0) S. Bangerter
Analysis of the mechanics of movement in various activities to develop the highest degree of skill.

**662. Administration and Public Relations.** (3:3:0) F. Hartvigsen
Administrative and public relations problems at all school levels: local, state, and national.

**663. Planning Facilities.** (2:2:0) S. Kimball
Basic planning for facilities for school and community physical education and recreation programs.

**670. History of Physical Education.** (3:3:0) S. Holbrook
History of physical education from ancient civilization to present day.

**673. Physical Education in the Elementary School.** (3:3:0) Su. Holbrook
For the teacher, the principal, and the supervisor. Emphasis on objectives, interrelationships with the curriculum, and the content material used in accomplishing educational results.

**692. Research Methods in Physical Education.** (3:3:0) F. Geddes

**694. Individual Study.** (2:1:1) F.S.
Readings from recently published professional literature.

**696. Seminar in Problems.** (1:1:0)

**698. Field Project, Master's Degree.** (6:0:0) F.S.Su. Geddes, Holbrook

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Geddes, Holbrook

# Physics

**Professors:** J. H. Gardner (chairman, 296 ESC), Eastmond, Fletcher, Hales, A. Hill, McNamara.
**Associate Professors:** Ballif, Barnett, Decker, Dibble, Dixon, Dudley, A. L. Gardner, M. Hill, Nelson, Vanfleet.
**Assistant Professors:** K. Hansen, Harrison, Jensen, Jones, Larson.

The Physics Department offers the degree of Master of Science, Master of Arts, and Doctor of Philosophy. The Master of Science degree generally is taken by those who intend to continue on for the Ph.D. degree, but it also serves as a terminal degree for many who intend to go into industrial or governmental research or into teaching. The Master of Arts degree is intended primarily for prospective secondary and junior college teachers. The Ph.D. degree is awarded for a high degree of scholarly achievement in the subject matter of physics and in research. It is not granted simply upon completion of certain routine requirements. General requirements for these degrees are outlined by the Graduate School. Following are special requirements relating to the Department of

Physics. The student who expects to continue into a Ph.D. program is advised to begin his planning for it as soon as he enters the Graduate School.

A student entering a graduate degree program in physics will be required to take a written proficiency examination before the end of the first week of his enrollment in Graduate School. This is designed to assist in placing the student in the appropriate course program. The examination will cover undergraduate work in mechanics, electricity and magnetism including physical optics, modern physics, and thermal physics. If the student fails in one or more of these areas he should register in the appropriate undergraduate course or courses which he should pass with an A or B grade. A student may, however, retake the examination before the end of the first week of his second semester, but failure this time in one or more fields would make it mandatory for him to enroll in the appropriate courses if he is to remain in the degree program.

### Master of Science Degree

The basic requirements for the master's degree in physics are the same as the general Graduate School requirements. This degree may be taken with a minor (Option I) or without a minor (Option II). A recommended minor is mathematical physics, which may be satisfied with Math. 617, 618 and Physics 621.

A student seeking only a master's degree with the intent of going into research or development work would find the courses listed in item B-2 under the Ph.D. requirements to be profitable. However, he may find it to his advantage to substitute some more specialized courses or some undergraduate courses where this can be done in conformity with the regulations of the Graduate School.

### Master of Arts Degree (MA-3 Program)

A student who intends to become a teacher in secondary education or in a junior college may find it to his advantage to enter the MA-3 program. This is an accelerated program beginning in the junior year designed to enable a student to (1) obtain a B.A. degree is physics with a teaching minor in mathematics at the end of his senior year, (2) obtain an M.A. degree in physics with one additional year's study, and (3) obtain a Utah Secondary School Teaching Certificate. Prerequisites for the program are Math. 111 and 112 or their equivalent. The program is designed so that the student may, if he desires, spend one or two years in teaching between his senior and first graduate years. The curriculum for each of these three years follows:

| **Junior Year** | **F** | **S** | **Su** |
|---|---|---|---|
| Math. 213, 314 | 5 | 3 | |
| Tchr. Ed. 301 | 2 | | |
| Physics 211, 212, 213, 214 | 5 | 5 | |
| Phys. Sci. 377 | | 3 | |
| Religion | 2 | 2 | |
| Math. 301, 302 | 3 | 3 | |
| Chem. 105, 106 | | | 8 |
| | 17 | 16 | 8 |

| **Senior Year** | **F** | **S** | **Su** |
|---|---|---|---|
| Physics 315, 316 | 4 | | |
| Math. 334, 371 | 3 | | 3 |
| Physics 300 | 3 | | |
| Physics 321, 322 | 4 | 4 | |
| Physics 396 | 1 | | |
| Phys. Sci. 479 (½ day all semester | | 8 | |
| Tchr. Ed. 310 | | | 2 |
| Tchr. Ed. 403 | | 4 | |
| Health 362 | 2 | | |
| Tchr. Ed. 415 | | | 2 |
| Religion | | 2 | 2 |
| | 17 | 18 | 9 |

| **Graduate Year** | **F** | **S** | **Su** |
|---|---|---|---|
| Physics 511 | 3 | | |
| Physics 551, 552 | 3 | 3 | |
| Two semesters Physics series | 3 | 3 | |
| Minor | 3 | 6 | |
| Physics 699 (Thesis) | | | 6 |
| | 12 | 12 | 6 |

**Suggested Minors:**
Math. 387, 501, 502; Grad. Ed. 601, 636, 639, 660.

### Doctor of Philosophy Degree

It is expected that the student will meet the general requirements of the Graduate School for advanced degrees. The following special requirements relate

to a degree in physics. These automatically satisfy the major and minor requirements of the Graduate School:

**A. Admission to Degree-Seeking Status**

Study leading to an advanced degree in physics is contingent upon admission to the Graduate School. It is expected that the student shall have satisfactorily completed the following courses or their equivalents. Physics 211, 213, 315, 316, 321, 322, 341, 342, 431, 471 and Math. 244, 314, 434, 541, 542. Upon approval by the student's advisory committee some other advanced mathematics series may be substituted for Math. 541 and 542. A student may remove any deficiencies by special examination or by registering for any of these courses at the outset of his graduate studies and earning "A" or "B" grades in them. Credit so earned may not be applied toward meeting the requirements for the Ph.D. degree.

**B. Formal Course Work**

1. A minimum of 52 hours in approved course work.
2. The following courses or their equivalents with grade of "A" or "B":
   a. Mathematical Physics (Math. 617, 618).
   b. Elements of Quantum Theory (Physics 551), and The Atomic Nucleus (Physics 552).
   c. Dynamics (Physics 621).
   d. Mathematical Theory of Electricity and Magnetism (Physics 641, 642).
3. At least 12 credit hours in that field listed below which is most closely related to the field of the student's research, to constitute a major; and 12 credit hours in a second field to constitute a minor. A student selecting nuclear physics or solid state physics as his major field must select theoretical physics as his minor field. The student whose research is in biophysics may, with the approval of his committee, construct a 12-hour minor which includes courses outside the department. His major field must be one of those listed below.
   a. Acoustics. Courses which will satisfy this requirement are: Physics 561, 562, 563, 564, 623, 681.
   b. Astrophysics. Courses which will satisfy this requirement are: Physics 521, 522, 527, 528, 611, 612, 623, 625, 627, 628, 671.
   c. Atomic Physics and Spectroscopy. Courses which will satisfy this requirement are: Physics 671, 672 with additional courses selected from 527, 528, 651, 652 and, depending upon content, 711.
   d. Nuclear Physics. Courses which will satisfy this requirement are Physics 655, 656, with additional courses selected from 681, 751, 752, and depending upon content, 711.
   e. Plasma Physics. Courses which will satisfy this requirement are: Physics 645, 646 with additional courses selected from 536, 537, 623, 631, 632.
   f. Solid State Physics. Courses which will satisfy this requirement are: Physics 623, 631, 681, 682 and depending upon content, 711.
   g. Theoretical Physics. Courses which will satisfy this requirement are: Physics 625, 631, 651, 652, 751, 752.
   h. Planetary and Space Physics. Courses which will satisfy this requirement are: Physics 536, 537 with additional courses selected from 645, 646, 671, 672 and, depending upon content, 711.
4. Graduate Seminar, for which the student may receive 4 hours credit.

**C. Comprehensive Examinations**

Before the student is admitted to candidacy for the Ph.D. degree, he must pass a series of written examinations covering the courses in item B-2 and an

oral examination covering the two general fields selected under item B-3. Normally these examinations will be taken toward the end of the second year.

**D. Acceptance for Research**

Before admission to candidacy, the student must be tentatively accepted as a research student by a member of the faculty of the Physics Department. The student may become acquainted with research opportunities available by attendance at seminars, lectures, discussions with faculty and graduate students, etc.

**E. Admission to Candidacy**

The student is admitted to candidacy after (1) completing two years of graduate study, (2) passing the written proficiency examination, (3) passing the language examinations, (4) passing the comprehensive examinations, and (5) obtaining approval of a subject for the dissertation.

**F. Dissertation**

The student must present a written dissertation embodying the results of original research judged by his committee to be suitable in whole or in part for publication in a professional journal.

**G. Defense of Dissertation**

The student must give an oral presentation and defense of the dissertation before his committee and others designated by his committee.

**H. Fields Presently Available for Original Research**

- Theoretical Physics
- Physics of the Solid State
  - High pressure phenomena
  - Low-temperature phenomenon
  - Magnetic resonance
  - Micro-wave spectroscopy
- Astro-Geophysics
  - Astronomy
  - Astrophysics
  - Planetary physics
- Plasma Physics and Magnetohydrodynamics
- Spectroscopy
- Nuclear and particle physics
  - Nuclear structure
  - Fundamental atomic constants
- Acoustics
- Biophysics

## Courses

**300. Philosophical Foundations of Modern Physics.** (3:3:0) (G-PS-m) Prerequisite: college level course in chemistry or physics, or consent of instructor. A. Hill

Selected topics of modern physics, e.g. relativity and quantum mechanics will be briefly developed and examined for their philosophical implications. Some current challenging problems will be explored.

**303. Survey of Atomic and Nuclear Physics.** (3:3:0) S. (m) Prerequisites: Physics 201, 202 or 211, 213. Miller

Primarily for nonphysical science majors. Elementary particle and radiation physics including atomic structure, spectra, X-rays, nuclear structures, nuclear processes, and applications.

**Successful completion of Math. 213, Physics 211 and 213 or their equivalents are prerequisite to all courses above 310.**

**315. General Physics: Atomic and Nuclear.** (3:3:0) F.S.Su. (m) M. Hill

Fundamental particles, atomic and molecular structure, Bohr theory, spectra, X-rays, quantum effects, special relativity, radioactivity, nuclear forces and nuclear reactions.

**316. Atomic and Nuclear Physics Laboratory.** (2:1:3) F.S.Su. (m) Prerequisite: completion of a concurrent registration in Physics 315. M. Hill, Miller

Required of all physics majors. Experimental work in particle and radiation physics.

**321, 322. Mechanics.** (4:4:0 ea.) F.S. (m) Prerequisite: Math 317. Dudley
Methods of classical mechanics applied to equilibrium, particle motion, central forces, small oscillations, conservation principles, and rigid body dynamics, with an introduction to Lagrange's equations.

**341, 342. Electricity and Magnetism.** (3:3:0 ea.) F.S. (m) Prerequisite: Math. 317. Jones
Classical theory of electricity and magnetism developed from its experimental foundations. Electrostatics, magnetostatics, currents and their associated fields, circuit theory, Maxwell's equations.

**386. Advanced Experimental Techniques.** (1:1:2)
Basic techniques in electrical, optical, thermal, electronics, etc. measurements and instrumentation for contemporary experimental physics.

**387. Advanced Physics Laboratory.** (2:1:3) F.S.
Application of contemporary methods and instruments to the experimental observations and measurement of classical and modern physical phenomena.

**391, 392. Seminar in Current Physics.** (1:1:0 ea.) F.S. Prerequisite: consent of instructor.
For junior physics majors enrolled in the Honors Program.

**431. Thermal Physics.** (3:3:0) S. (m) Prerequisites: Physics 211 and 213. Larson
Fundamental principles of thermodynamics with introduction to the concepts of kinetic theory and statistical mechanics for physicists, chemists, and engineers.

**441. Electronics for Physicists.** (5:3:6) F. Prerequisite: Physics 342. Jones
Fundamental concepts of electronics and basic circuitry with emphasis on the tools needed for specialized research in a variety of fields of physics.

**471. Optics and Electromagnetic Theory.** (3:3:0) S. (m) Prerequisites: Physics 342, and Math 334, or consent of instructor. Eastmond

**497, A,B,C. Introduction to Research.** (1-3:0:2-6 ea.) Arr. (m)

**511. Introduction to Theoretical Physics.** (3:3:0) Su. Prerequisites: Math 334 and 317, or consent of instructor.
Introduction to basic principles of physics with emphasis on their mathematical formulation. Topics treated vary from year to year.

**513A,B,C,D. Special Topics in Contemporary Physics.** (1-3:1-3:0 ea.) Arr. Prerequisite: consent of instructor.
Course content varies from year to year. Subject matter will generally be related to recent developments in physics.

**521, 522. Celestial Mechanics.** (3:3:0 ea.) F.S. Prerequisite: consent of instructor. Hansen
Fundamental principles of celestial mechanics and orbital computations.

**527, 528. Introduction to Astrophysics.** (3:3:0 ea.) F.S. Prerequisite: consent of instructor. McNamara
Fundamental principles and observational techniques of astrophysics.

**536, 537. Space and Planetary Physics.** (3:3:0 ea.) F.S. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor. Ballif, Jones
Topics will include solar physics, interplanetary fields, atmospheres of earth and planets.

**551. Elements of Quantum Theory.** (3:3:0) F. Prerequisites: Physics 315 and Math. 317 or equivalents. J. Gardner
Basic course in modern theory of radiation and particle physics for physicists, chemists and engineers. Topics include elementary treatments of relativity theory, quantum mechanics with spectroscopic applications, quantum statistics, and solids.

552. **The Atomic Nucleus.** (3:3:0) S. Prerequisite: Physics 551. J. Gardner
Basic course in nuclear physics for physicists, chemists, and engineers. Topics include description of nuclear properties, scattering theory, nuclear reactions, and elementary theory of the nucleus.

561, 562. **Fundamentals of Acoustics.** (3:3:0 ea.) F.S. (Offered 1966-67 and alternate years)
Vibrating systems, transmission phenomena, theory of acoustical radiators, and applications of acoustics.

563, 564. **Acoustical Measurements.** (2:2:0 ea.) F.S. (Offered 1966-67 and alternate years) Prerequisite: completion of or concurrent registration in Physics 561 and 562.
Selected experiments in acoustics.

611, 612. **Astrophysics.** (3:3:0 ea.) F.S. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor. McNamara
The theory of stellar atmospheres and interstellar matter.

621. **Dynamics.** (3:3:0) F. Prerequisite: Physics 322. Harrison
Advanced treatment of classical mechanics. including Lagrange's and Hamilton's equations, rigid body motion, and canonical transformations.

623. **Dynamics of Continuous Media.** (3:3:0) S. (Offered 1966-67 and alternate years) Prerequisite: Physics 621.
The mechanics of systems with an infinite number of degrees of freedom. Topics include elasticity and hydrodynamics.

625. **Theory of Relativity.** (3:3:0) S. (Offered 1967-68 and alternate years) Prerequisite: Physics 621. Harrison
Fundamentals of special relativity, applications to dynamics and electromagnetism, and introduction to general relativity.

627, 628. **Advanced Topics in Astrophysics.** (3:3:0 ea.) F.S. (Offered 1967-68 and alternate years) Prerequisite: consent of instructor. McNamara
Internal structure of stars; galactic structure.

631, 632. **Statistical Mechanics.** (3:3:0 ea.) F.S. Decker
Review of thermodynamics; classical statistical mechanics quantum statistics, transport theory.

641, 642. **Mathematical Theory of Electricity and Magnetism.** (3:3:0 ea.) F.S. Prerequisite: Physics 342. Harrison
Advanced electrostatics and magnetostatics; Maxwell's equations and electromagnetic waves; relativistic electrodynamics, radiation theory, interaction of matter with electromagnetic fields.

645, 646. **Plasma Physics.** (3:3:0 ea.) F.S. (Offered on sufficient demand) Prerequisites: Physics 431, 621 and 642.
A study of the plasma state of matter, including a description both in terms of individual particles and in terms of a fluid, with applications.

651, 652. **Quantum Mechanics.** (3:3:0 ea.) F.S. Prerequisites: Physics 551, 621; Math. 618. Nelson
Nonrelativistic quantum mechanics logically developed with applications.

655. 656. **Nuclear Physics.** (3:3:0 ea.) (Offered on sufficient demand) Prerequisite: Physics 552. Dixon, Jensen
Fundamental properties of nuclei, nuclear forces, nuclear models, electromagnetic properties of nuclei, particle radioactivity, nuclear reactions, and interaction of radiation with matter.

671. **Atomic Spectroscopy.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: Physics 551 or consent of instructor. Eastmond
Observation and analysis of atomic spectra; series, multiplet structure, Zeeman effect; selection rules, transition probabilities, energy levels, atomic structure.

**672. Molecular Spectroscopy.** (3:2:3) S. (Offered 1966-67 and alternate years) Prerequisite: Physics 671. Eastmond

Analysis of band spectra; molecular rotational, viberational and electronic energy levels; determination of molecular structure.

**681, 682. Modern Theory of the Solid State.** (3:3:0 ea.) F.S. Prerequisites: Physics 431 and 551. Decker, Vanfleet

An introductory course for students in physics, chemistry and engineering. Physical properties of atomic and molecular systems which are arranged in a regular periodic structure.

**691, 692. Seminar.** (1:1:0 ea.) F.S.

**697. Research.** (Arr.)

**699. Research and Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**711, A,B,C. Advanced Topics in Physics.** (1-3:1-3:0 ea.) F.S. Prerequisite: consent of instructor.

Course content varies from year to year. Special topics in theoretical and experimental physics are treated.

**751, 752. Advanced Quantum Theory.** (3:3:0 ea.) F.S. (Offered 1966-67 and alternate years) Prerequisite: Physics 652 or consent of instructor.

Topics in relativistic quantum mechanics including quantum field theory.

**791, 792. Seminar.** (1:1:0 ea.) F.S.

**797. Research.** (Arr.)

**799. Research and Dissertation for Ph.D. Degree.** (Arr.)

# Political Science

**Professors:** Bernhard (chairman, 270 M), Grow, Reeder.
**Associate Professors:** Mabey, Melville, Slover.
**Assistant Professors:** Farnsworth, Hart, Hillam, Midgley, Monson, Morrell. Snow, Williams.

The Department of Political Science offers work leading to the Master of Arts degree.

### Major Requirements

The requirements for the Master of Arts degree are the general requirements of the Graduate School.

For full graduate standing in political science, a student is expected to have completed approximately the equivalent of an undergraduate major.

Six fields of concentration are available in political science:

1. Political Philosophy and Theory
2. American Government and Politics
3. Public Administration
4. Foreign Government and Politics
5. Public Law
6. International Relations

In consultation with his advisory committee, a graduate student will choose a program of study from three of the above fields, plus an additional field or fields in a minor department or supporting departments. A minimum of 20 hours must be from the 500 and 600 level offerings.

### Minor

A graduate minor in political science may be taken with less than an undergraduate minor as a background, after consultation with the department.

### Junior College Teaching in Political Science

For those graduate students desiring to take advantage of the increasing opportunities in junior college teaching, the department in cooperation with the Graduate Department of Education offers a junior college teaching credential. The credential requires six to ten hours: Graduate Education 640 (3 credits), and/or Graduate Education 642 (3 credits), and Graduate Education 644 (3-4 credits). The latter involves the directed teaching of a basic political science course for one semester.

### Courses

**302. Introduction to Political Philosophy.** (3:3:0)

**310. Parties and Pressure Groups in the U. S.** (3:3:0) F. (m) Grow, Hart, Williams

**315. Public Opinion and Propaganda in the U. S.** (2:2:0) S. (m) Bernhard, Grow, Hart, Williams

**320. American Legislative System.** (3:3:0) S. (m) Bernhard

**321. Political Behavior.** (3:3:0) S. (m) Hart, Midgley

**322. Contemporary Problems.** (2:2:0) F.S. (m)

**323. Intergovernmental Relations in the United States.** (3:3:0) S. (m) Snow

**330. Introduction to Public Administration.** (3:3:0) F.S. (m) Grow, Snow, Williams

**350. Government of the Soviet Union and Eastern Europe.** (3:3:0) F. (m) Mabey, Morrell

**352. Government and Politics of East Asia.** (3:3:0) S. (m) Hillam, Farnsworth

**355. Government and Politics of United Kingdom and the Commonwealth.** (3:3:0) F.S. (m) Mabey

**356. Governments and Politics of South America.** (3:3:0) S. (m)

**357. Government and History of Canada.** (3:3:0) Grow

**358. Governments and Politics of Southeast Asia.** (3:3:0) Hillam, Farnsworth

**360. Constitutional Law of the U.S. I.** (3:3:0) S. (m) Prerequisite: Pol. Sci. 110. Reeder, Williams

**361. Constitutional Law of the U.S. II.** (3:3:0) S. (m) Reeder, Williams

**365. American Constitutional History.** (3:3:0) F. Home Study also. (m) Prerequisite: Pol. Sci. 110. Melville

**370. Theory of International Politics.** (3:3:0) F. (m) Farnsworth, Hillam

**371. Development of American Foreign Policy.** (3:3:0) S. Home Study also. (m) Hillam, Melville

**375. International Organization.** (3:3:0) F. (m) Hillam, Monson

**403. Modern Political Philosophy.** (3:3:0)

**406. American Political Thought.** (3:3:0) S. Home Study also. (m) Melville

**456. Governments and Politics of Mexico and the Caribbean Area.** (3:3:0) S.

**457. The Military in Government and Politics.** (3:3:0) S. (m) Slover

**464. Jurisprudence.** (3:3:0) S. (m) Hart, Midgley

**468. Anglo-American Legal Institutions.** (3:3:0) S. (m) Melville, Reeder

**498, A,B,C. Directed Readings in Political Science.** (honors) (1-2:0:1-2 ea.)

**500. Research and Writing in Public Administration.** (3:3:0) F.S. Snow, Williams
Public administration data, forms and procedures in report writing, research patterns, and production of research reports. Designed for students who have not had Political Science 300 and who need training in research and writing in public administration.

**503. Contemporary Political Philosophy.** (3:3:0) Midgley, Monson
Survey of the attack upon political philosophy by political theorists and the various attempts to revive it by philosophers and theologians.

**510. American Political Problems.** (2:2:0) F. Bernhard, Grow, Hart, Williams
Intensive study of selected problems relating to the noninstitutional workings of the American political system.

**531. Principles of Public Organization and Management.** (3:3:0) (m) Snow, Williams

**532. Public Personnel Administration.** (3:3:0) F. (m) Grow, Williams
Treatment of processes, procedures, controls, and problems of personnel and fiscal administration in executive branches of federal, state, and local governments.

**533. Budget and Fiscal Administration.** (3:3:0) F. (m) Recommended: Acctg. 201. Snow
The principles involved in governmental budget and fiscal administration. Emphasis is given at national, state, and municipal levels.

**534. State Government and Administration.** (3:3:0) F. (m) Snow

**535. Municipal Government and Administration.** (3:3:0) S. (m) Grow
Growth, development, and organization of cities; relationship of cities to other governments; problems and activities of modern cities.

**536. City Planning.** (3:3:0) S. (m) Recommended: Pol. Sci. 330; Geog. 522; Sociol. 423.
Basic problems and techniques involved in city planning.

**537. Public Works and Safety Administration.** (3:3:0) F. (m) Recommended: Pol. Sci. 330; any two of Sociol. 380, 383, 386; Psycho. 350.
Basic factors underlying the efficient operation of police and fire and public works departments. Sociological and psychological problems involved, organization patterns, public relations, budget, etc.

**538. International Project Administration.** (3:3:0) (Offered alternate years) (m) Recommended: Pol. Sci. 110, 115, 330; Hist. 120, 121. Snow
The administration of United States programs abroad. Problems faced, living conditions, techniques of administration, approaches to education, etc.

**539. Comparative Public Administration.** (3:3:0) S. (Offered alternate years) Grow, Snow, Williams
Comparative analysis of various administrative procedures and practices.

**563. Administrative Law of the U.S.** (3:3:0) F. (m) Reeder
Legal setting for administrative bodies and judicial control of administrative action. Cases in administrative law read and discussed.

572. **Foreign Policy of Soviet Union and Eastern Europe.** (3:3:0) S. (m) Mabey, Morrell

Marxist-Leninist concepts of international politics and their practical application including such issues as the Communist International and "peaceful coexistence."

575. **International Law.** (5:5:0) S. (m) Reeder

Nature and function of international law; recognition, succession, jurisdiction, rights, and immunities of states; nationality and jurisdiction over nationals.

580. **International Politics of Asia.** (3:3:0) S. (m) Recommended: Pol. Sci. 170. Farnsworth, Hillam

International relations of Asia with emphasis on the problems of imperialism, colonialism, nationalism, and communism.

645. **A,B,C. Graduate Colloquium.** (½:1:0)

690, **A,B,C,D. Seminar in Political Theory.** (1-3:1-3:0 ea.) Melville, Midgley

691, **A,B,C,D. Seminar in Politics.** (1-3:1-3:0 ea.) Bernhard, Grow Hart, Williams

693, **A,B,C,D. Seminar in Public Administration.** (1-3:1-3:0 ea.) Grow Slover, Snow, Williams

694. **Project in Public Administration.** (2:0:Arr.)

695, **A,B,C,D. Seminar in Comparative Government and Politics.** (1-3:1-3:0 ea.) Farnsworth, Mabey, Monson, Morrell

696, **A,B,C,D. Seminar in Public Law.** (1-3:1-3:0 ea.) Melville, Reeder

697, **A,B,C,D. Seminar in International Relations.** (1-3:1-3:0 ea.) Farnsworth, Hillam, Monson, Morrell, Reeder, Slover

698. **Directed Readings in Political Science.** (1-2:0:1-2)

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)

# Psychology

**Professors:** Allen, Hardy, Howell (chairman, 1230 SFLC), Moffitt, Robinson.
**Associate Professors:** Bennion, Daniels, Smith.
**Assistant Professors:** Anderson, Cundick, Payne, Pedersen, Stimpson.

The Department of Psychology offers graduate programs leading to the Master of Science and Ph.D. degrees.

At the master's degree level, a rigorous program in general phychology prepares the candidate for doctoral study; or for teaching in the junior colleges; or permits the graduate to enter beginning professional employment in a variety of settings. A two-year master's program in school psychology is offered jointly with the Graduate Department of Education.

At the doctoral level, the department offers specializations in clinical and social psychology, with minors or joint minors in measurement, genetic, personality, motivation, learning, cognition, and social, as detailed below.

Prospective graduate students are expected to acquaint themselves with all general regulations for advanced degrees as outlined by the Graduate School. Admittance to graduate work in psychology requires completion of the core courses for the undergraduate preprofessional major (general psychology, tests and measurement, and one seminar) or their equivalent.

For the graduate minor in psychology the student must have as undergraduate preparation Psych. 111, 311 (or 360 and 365), 370 or equivalent and additional courses to make a total of twelve semester hours. In addition to these twelve hours, he must have a minimum of nine semester hours that will be counted as graduate credit.

As part of the training of graduate students, a psychological clinic is maintained by the Psychology Department for the diagnosis and treatment of behavioral and emotional disorders in children and adults. A limited number of selected individuals (other than University students) will be accepted depending on the training needs of the department.

### The Master's Degree Program

All candidates for the master's degree entering the program Fall of 1965 or later must take the following courses or their equivalent: 520, 530, 550, 560, 562, 565, 585, 670, 671, and 690, for a course total of 29 hours. Also, in accordance with the policy of the Graduate School, 6 hours of thesis credit must be taken. Students should plan on a minimum of two semesters and a summer to complete this work. Graduate assistants and others working part-time will need to adjust their schedules accordingly.

This demanding program requires that students will ordinarily follow Option II (p. 38 of the catalog), with not external minor. A student may elect a minor field, but he will still need to fulfill the above major requirements.

Any deviations from the above program must be recommended by the student's advisory committee and approved by the department. The advisory committee may require such additional courses as it deems necessary.

Requirements for the degree include: (1) completion of the above courses, and any others as required by the advisory committee: (2) a thesis, usually reporting the results of original research, which is supervised by the student's advisory committee; and (3) satisfactory performance in a final oral examination. on thesis and subject fields.

### Requirements for the Doctor of Philosophy Degree

In general, students are not admitted to the Ph.D. program until completion of a master's degree (research experience of an equivalent nature may be approved by the department).

Requirements for the Ph.D. degree include (1) a foreign language requirement (catalog p. 42); (2) formal course work, as detailed below under the specific majors; (3) comprehensive examinations covering the broad field of psychological content and methodology. The courses required for the master's degree are a solid foundation for these exams, which will ordinarily be taken during the first semester of doctoral work; (4) a specialty examination covering a major and minor field, which will ordinarily be taken by the end of the second year of doctoral study. Completion of the above four requirements is necessary before admission to candidacy; (5) a dissertation embodying the result of original research of professional caliber done under the supervision of the advisory committee.

Fields presently available for doctoral specialization are as follows:

| Major Fields | Minor Fields* | Joint Minors** |
|---|---|---|
| Clinical | Social | Genetic Motivation Cognition Social |
| Social | Measurement | Personality Learning Measurement |

*The minor requires a minimum of 12 hours of course work.

**Two of these areas may be combined to compose a minor, as approved by the advisory committee, with at least 6 hours in each area.

### The Ph.D. in Clinical Psychology

In addition to the requirements listed above, the degree in clinical psychology requires completion of one year of internship in a hospital or institution approved by the department.

The major in clinical psychology will be drawn up by the advisory committee. However, the following are specific course requirements:

1. General Psychology. It is understood that the student will have completed the courses required for the master's degree( or their equivalent). (29 hours).
2. Psychodynamics of Behavior. (12 hours)
   540. Abnormal Psychology. (3:3:2)
   651. Problems in Psychopathology. (3:3:0)
   665. Human Motivation. (3:3:0)
   675. Personality Dynamics. (3:1:4)
3. Diagnostic Methods. (12 hours) Prerequisite: Psych. 378.
   640. Individual Test Practice. (5:1:8)
   740. Introduction to Projective Techniques. (2:2:0)
   741. Rorschach Test Practice. (3:1:8)
   743. Practicum: Diagnostic Testing. (2:0:6)
4. Psychotherapy. (12 hours) Prerequisite: Psych. 540.
   680. Introduction of Psychotherapy. (3:3:0)
   780. Individual Psychotherapy: Practicum. (3:1:8)
   781. Individual Psychotherapy: Practicum. (3:1:8)
   782. Group Therapy: Theory and Practice. (3:1:8)
   or
   783. Play Therapy: Theory and Practice. (3:3:3)

### The Ph.D. in Social Psychology

The major in social psychology will be drawn up by the advisory committee from the following, plus appropriate supporting courses. It is understood that the student will have completed the courses required for the master's degree (or their equivalent), including 530. (29 hours).

555. Group Dynamics. (3:3:0)
630. Attitude Change. (3:3:0)
730. The Consultative Process. (3:2:2)
757. Practicum in Group Development. (3:1:4)
792, A,B,C. Seminar in Social Psychology. (2 ea.)
Sociology 552. Personality: Culture and Society. (3:3:0)

### Courses

**510. The Psychology of Aesthetics.** (2:2:0) (Offered alternate years) (m) Prerequisite: Psych. 111. Daniels
The arts of perceptual stimuli; the nature of artistic creativity; phychological symbolism expressed in the arts; the artist as a person.

**520. Research and Method in Genetic Psychology.** (3:3:0) S. Cundick
An overview of major research in genetic psychology with emphasis placed on theory, content, and methodology.

**530. Theory and Research in Social Psychology.** (3:3:0) S. Prerequisite: Sociol. 350 or Psych. 350.
A survey, in depth, or current theory and research in social psychology, with emphasis on understanding the individual in his interpersonal interaction.

**540. Abnormal Psychology.** (3:3:2) F.S.Su. (m) Prerequisites: Psych. 111, and five additional hours of psychology. Bennion, Howell, Payne
Dynamics of maladjustment; implications for normal behavior; review of major and minor psychological disorders; modern therapeutic procedures; field work at Utah State Hospital.

**550. Personality Theory.** (3:3:0) S.Su. (m) Prerequisites: Psych. 111, 450, and five additional hours in psychology. Allen, Howell, Moffitt
A critical review of the contemporary theories of personality that have been developed within the framework of major psychological systems.

555. **(Sociol.-Psych.) Group Dynamics** (3:3:0) S. (m) Prerequisite: Sociol.-Psych. 350. Dyer, Hardy, Smith, Stimpson
May be used for credit either in psychology or sociology, but not in both. Research and theories in group dynamics.

560 **Learning Theory** (3:3:0) F. (m) Prerequisite: Psych. 111, 450, and five additional hours in psychology. Allen, Jensen
A critical review of current theories of learning and persistent problems.

562. **Perception and Cognition** (3:3:0) Prerequisite: Psych. 360, 362, or equivalent; graduate standing or consent of instructor. Allen, Daniels
A study of major theoretical and empirical developments in perception and cognition with emphasis on the interaction of sensory, perceptual, learning, and thinking processes.

565. **Motivational Psychology.** (3:3:0) F. Prerequisites: Psych. 365 or equivalent; graduate standing or consent of instructor. Daniels, Hardy
Historical development of motivational psychology; theoretical and empirical overview of the field; recent trends and current issues. Role of animal studies; methodological problems.

570. **Computer Use in Behavioral Sciences.** (3:3:6) F.S. Prerequisite: Psych. 370 or equivalent. Carlson
The use of electronic digital computers in the behavioral sciences.

574. **Advanced Experimental Psychology.** (2:1:5) S. (m) Prerequisites: Psych. 111, 374, or equivalent. Allen, Anderson
Principles of instrumentation; varieties of experimental designs; nature of experimental controls. Gives experience in planning, conducting, and reporting original exploratory experiments.

580 **Comparative Psychology.** (3:3:0) S. (m) Prerequisite: Psych. 111. Anderson
Survey of methods and results of research on animal learning, innate behavior, motivation, individual differences, social behavior, abnormal behavior; correlation of structure with function.

585. **Advanced Physiological Psychology.** (3:3:0) F. (m) Prerequisite: Psych. 111. Anderson
Critical study of physiological processes and psychological functions; physiological mechanisms underlying behavioral processes, including sensation, emotion, sleep and activity, motivation, and learning.

598. **Independent Research.** (1-3:0:2-6) F.S.

610. **History and Systems of Psychology.** (3:3:0) S. Prerequisite: graduate standing.
A survey of the origins and development of modern psychology including consideration of the schools and theoretical systems which have emerged up to the present day.

620. **Advanced Genetic Psychology.** (3:3:0) (Offered alternate years) Prerequisite: Psych. 520. Cundick
A critical consideration within the developmental framework of factors affecting socialization, intelligence, motor development, language processes, and other important behavioral variables.

626. **Mental Deficiency.** (2:2:0) F. Prerequisite: Psych. 378 or equivalent. Allen

628. **Psychology of the Physically Handicapped.** (2:2:0) F. (Offered alternate years) Prerequisite: Psych. 378.

630. **Attitude Change.** (3:3:0) F. Prerequisite: graduate standing or consent of instructor.
An examination of various theoretical approaches to the study of attitude development, change, and assessment, including a focus on both individual and mass persuasion.

**640. Individual Test Practice.** (5:3:8) F.S.Su. Prerequisite: Psych. 378 or Grad. Ed. 645 and consent of instructor. Bennion, Cundick, Howell

**642. Special Diagnostic Tests.** (2:0:6) S. Prerequisite: Psych. 640. Bennion

**645. Professional Problems in Psychology.** (3:3:0) S. Prerequisite: major or minor in psychology. Howell

**651. Problems in Psychopathology.** (2:2:0) S. Prerequisites: Psych. 540 and consent of instructor. Bennion, Howell

**654. Dynamics of Religious Behavior.** (3:3:0) Prerequisite: Psych. 111. Allen

**662. Complex Thought Processes.** (3:3:0) S. Prerequisite: Psych. 360. Daniels

**665. Human Motivation.** (3:3:0) F.S. Prerequisite: Psych. 365 or equivalent; graduate standing in psychology or allied discipline. Hardy

**670. Advanced Statistics I.** (3:3:0) F. Prerequisite: Psych. 370. Pedersen, Smith

**671. Advanced Statistics II.** (3:3:0) S. Prerequisite: Psych. 670. Pedersen

**672. Psychological Scaling.** (3:3:0) S. (Offered alternate years) Prerequisite: Psych. 670. Pedersen
Scaling theory and methodology, with emphasis upon measurement in psychophysics and differential psychology.

**673. Multivariate Analysis in Psychology.** (3:3:0) S. (Offered alternate years) Prerequisite: Psych. 670. Pedersen
The principal descriptive statistics used in the analysis of multiple measurements: factor analysis, canonical correlation, multivariate analysis of variance and covariance, and multiple discriminant analysis.

**675. Personality Dynamics.** (3:3:0) F. Prerequisites: undergraduate core courses and consent of instructor. Howell, Moffitt

**678. Measurement Theory.** (3:3:0) S. Pedersen

**680. Introduction to Psychotherapy.** (3:3:0) S. Prerequisites: undergraduate core courses and consent of instructor. Bennion, Robinson

**690. Seminar: Research Problems.** (2:2:0) F.

**695. Independent Readings.** (1-2:Arr.:Arr.) F.S.Su.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

**730. The Consultative Process.** (3:2:2) (Offered alternate years) Prerequisite: Psych. 357.
Nature of the consultative relationship. Essential elements involved in consultation, forces operating in consultation relationship, developing effective strategy for consultation.

**740. Introduction to Projective Techniques.** (3:2:3) F. Prerequisites: Psych. 550 and 640. Bennion, Robinson

**741. Rorschach Test Practice.** (3:1:8) S. Prerequisite: Psych. 740 Bennion, Howell

**743. Practicum: Diagnostic Testing.** (2:0:6) F.S. Prerequisite: Psych. 741. Bennion, Howell, Payne

**747. Internship in Clinical Testing.** (2-4:1:5-11) F.S.Su. Prerequisite: Psych. 743. Bennion, Howell

**748. Internship in Clinical Testing.** (2-4:1:5-11) F.S.Su. Prerequisite: Psych. 747. Bennion, Howell
Continuation of Psych. 747.

**750, 751, 752, 753. Hospital Internship.** (0:0:32 ea.)

**757. Practicum in Group Development.** (3:1:4) Prerequisites: graduate standing in psychology or sociology, Sociol.-Psych. 357, 555, consent of instructor.

**780. Individual Psychotherapy: Practicum.** (3:1:8) F.Su. Prerequisite: Psych. 680. Bennion, Howell

**781. Individual Psychotherapy: Practicum.** (3:1:8) S. Bennion, Howell
Continuation of Psych. 780.

**782. Group Therapy: Theory and Practice.** (3:1:8) S. Prerequisite: Psych. 680. Howell

**783. Play Therapy: Theory and Practice.** (3:3:3) S. Prerequisites: undergraduate core courses and consent of instructor.

**790, A,B,C. Seminar in Genetic Psychology.** (2:2:0 ea.) Prerequisite: consent of instructor. Cundick

**791, A,B,C. Seminar: Personality.** (2:2:0 ea.) Prerequisite: consent of instructor.

**792, A,B,C. Seminar: Social Psychology.** (2:2:0 ea.) Prerequisite: consent of instructor, Sociol.-Psych. 350. Smith, Stimpson

**793, A,B,C. Seminar: Perception and Cognition.** (2:2:0) ea.) Prerequisite: consent of instructor.

**794, A,B,C. Seminar: Motivation.** (2:2:0 ea.) Prerequisite: consent of instructor. Daniels, Hardy

**797, 798. Independent Research.** (1-4:0:3-12 ea.) F.S. Prerequisite: consent of instructor.

**799. Ph.D. Dissertation.** (Arr.) F.S.Su.

# Recreation Education

**Professors:** I. Heaton (chairman, 273C RB), Hartvigsen.
**Associate Professors:** Jensen, Packer, Shaw.

### Requirements

An undergraduate major or equivalent in the field and acceptance by the department chairman are necessary for admission. A qualifying written and oral examination will be given each student before final acceptance.

With the approval of the department chairman and the advisory committee, a student may pursue one of two degrees.

The Master of Arts degree will be awarded upon the completion of a minimum of 24 hours of prescribed course work, an approved thesis and satisfactory performance in a final oral examination.

The Master of Recreation Education degree will be awarded upon completion of the following requirements: complete the same general requirements as all other master's candidates except that other requirements will substitute for the thesis. Complete 32 hours of course work approved by his advisory committee including 20 hours in the major, an approved minor of not less than 9 semester hours, or a maximum of 12 hours from approved related fields; complete a research project which conforms to the standard for the thesis (the project must be approved by the assigned instructor and filed in the department chairman's office two weeks before the final oral examination is scheduled), pass a final written examination related to the major; pass a final oral examination conducted by graduate faculty members for the major and minor fields.

### Courses

502. **Camping Workshop.** (2:2:0) S.Su. Packer

503. **Administration of School and Community Camps.** (2:2:0) S.

505. **Administration of Community Recreation.** (3:3:0) S.Su. I. Heaton

570. **Recreation for the Ill and Handicapped.** (2:2:0) S.Su. Prerequisite: Psych. 111.

583. **Workshop in Recreational Dance.** (2:2:0) S.Su. A. Heaton

**Physical Education 663. Planning Facilities.** (2:2:0) C. Jensen

609. **The Recreation Program.** (2:2:0) F.Su. I. Heaton

691. **Graduate Seminar.** (0:1:1) F.S.Su. I. Heaton

692. **Research Methods in Recreation.** (3:3:0) F.S.Su. D. Shaw

694. **Seminar in Readings.** (2:2:0) F.S.Su. Hartvigsen

695. **Seminar in Community-School Recreation.** (2:2:0) F.Su. I. Heaton

696. **Seminar in Problems in Recreation.** (1:1:0) S.Su.

698. **Field Projects.** (1-4:2-5:0) F.S.Su. I. Heaton

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. I. Heaton

## Religious Instruction: Graduate Studies

**Professors:** Riddle (chairman, 123 JS), R. L. Anderson, Andrus, Barron, Belnap, Clark, Done, Doxey, Ludlow, Madsen, Nibley, Rich, Sperry, Yarn.
**Associate Professors:** Backman, Cowan, Horsley, Larson, Patch, Palmer (on leave), Pearson, Turner.
**Assistant Professors:** Berrett, Bowen, M. Petersen, H. D. Peterson.

The Department of Graduate Studies in Religious Instruction has three programs in which master's and doctor's degrees may be obtained. These programs are Bible and modern scripture, history of religion, and religious education. A general statement of the requirements for each degree is given below.

### Bible and Modern Scripture

In the area of Bible and modern scripture, programs are offered leading to the Master of Arts and Doctor of Philosophy degrees. Programs for minors in this area are offered on both master's and doctor's degree levels. A detailed statement of requirements for these degrees may be obtained upon request from the chairman of the Department of Graduate Studies in Religious Instruction. **The responsibility for knowing and fulfilling these requirements as well as the general requirements of the Graduate School rests with the student.**

#### Master of Arts Degree

After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

A. Attain a minimum of thirty semester hours of credit in approved courses.
B. Demonstrate proficiency in the scholarly use of one approved foreign language.
C. Write an acceptable thesis embodying the results of directed research.

D. Complete successfully an oral examination which will probe the subject-matter of the candidate's major and minor areas of study and the soundness of his thesis.

### Doctor of Philosophy Degree

Applicants for the doctorate must demonstrate a proficiency in one tool language and an adequate subject-matter background to be considered for admission to the department on a degree-seeking basis. After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

A. Demonstrate proficiency in the scholarly use of at least two foreign languages.
B. Attain a minimum of 60 hours of approved course work credit, plus 12 hours of dissertation credit. The following core courses are required of all students: Graduate Religion 501, 502, 503, 510, 511, 512, 527, 621, 622, 624, and 625.
C. Pass four four-hour written comprehensive examinations plus an oral examination in the same area. In these examinations the student is given the opportunity to demonstrate a thorough mastery of the subject matter of the major and minor fields.
D. Write an acceptable dissertation embodying the results of original research and constituting a valuable addition to scholarly knowledge.
E. Complete successfully an oral examination of the scholarship and writing exhibited in the candidate's dissertation.

## History of Religion

In the area of history of religion programs are offered leading to the Master of Arts and Doctor of Philosophy degrees. Programs for minors in this area are offered on both master's and doctor's degree levels. A detailed statement of requirements for these degrees may be obtained upon request from the chairman of the Department of Graduate Studies in Religious Instruction. **The responsibility for knowing and fulfilling these requirements as well as the general requirements of the Graduate School rests with the student.**

### Master of Arts Degree

Prerequisite to either a major or a minor in history of religion are the courses in undergraduate Relig. 441 and 442.

After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

A. Attain a minimum of thirty semester hours of credit in the history of religion.
B. Demonstrate proficiency in the scholarly use of one approved foreign language. Those students whose emphasis is in L.D.S. Church history are not required to have a language.
C. Write an acceptable thesis embodying the results of directed research.
D. Complete successfully an oral examination which will probe the subject matter of the candidate's major and minor areas of study and the soundness of his thesis.

### Doctor of Philosophy Degree

Applicants for the doctorate must demonstrate a proficiency in one tool language and an adequate subject matter background to be considered for admission to the department on a degree-seeking basis. After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

A. Demonstrate proficiency in the scholarly use of at least two foreign languages.

B. Attain a minimum of 60 hours of approved course work credit, plus 12 hours of thesis credit. The following core courses are required of all students: Graduate Religion 541, 542, 543, 544, 551, 552, 555, and 556.

C. Pass four four-hour written comprehensive examinations plus an oral examination in the same area. In these examinations the student is given the opportunity to demonstrate a thorough mastery of the subject matter of the major and minor fields.

D. Write an acceptable dissertation embodying the results of original research and constituting a valuable addition to scholarly knowledge.

E. Complete successfully an oral examination of the scholarship and writing exhibited in the candidate's dissertation.

## Religious Education

The program in religious education offers a Master of Religious Education (M.R.E.) and a Doctor of Religious Education (D.R.E.) degree. A detailed statement of requirements for these degrees may be obtained upon request from the chairman of the Department of Graduate Studies in Religious Instruction. **The responsibility for knowing and fulfilling these requirements as well as the general requirements of the Graduate School rests with the student.**

### Master of Religious Education Degree

Certification as a teacher on the secondary level is prerequisite to admission for this degree. The student accepted on a degree-seeking basis as a major in religious education must fulfill the following requirements under the direction of his advisory committee:

A. Attain a minimum of 30 semester hours of credit, not including thesis credit. This must include the following requirements:

The following courses:
Grad. Relig. 670 (2) (Survey of Religious Education)
Grad. Relig. 530 (2) (L.D.S. Theology)

Four hours from the following courses:
Grad. Relig. 570 (2), 571 (2), 673 (2), 674 (2) (methods)
Grad. Relig. 671 (2), 672 (2), 675 (2), 676 (2) (curriculum)

Eight hours from the following courses:
Grad. Relig. 501 (3), 502 (2), 503 (2), 510 (2), 511 (2), 512 (2) (Bible)
Grad. Relig. 541 (3), 542 (3), 543 (3), 544 (3), L.D.S. Church History)
Grad. Relig. 621 (3), 622 (3) (Book of Mormon)

An approved minor of at least 9 hours.

B. Write an acceptable thesis or conduct an appropriate field project.

C. Complete in a satisfactory manner an oral examination on the thesis or project report and on the subject matter of the student's major and minor fields.

The master's candidate for a minor in the field of religious education will be assigned an adviser to represent this department and must fill the following requirements:

A. The student must complete at least 10 hours of course work as follows:

The following courses:
Grad. Relig. 530 (2) (L.D.S. Theology)
Grad. Relig. 670 (2) (Survey of Religious Education)

Four hours from the following courses:
Grad. Relig. 570 (2), 571 (2), 671 (2), 672 (2), 673 (2), 674 (2), 676 (2)

Two hours from the following courses:
Grad. Relig. 541 (3), 542 (3), (L.D.S. Church History)
Grad. Relig. 501 (3), 502 (2), 503 (2), 510 (2), 511 (2), 512 (2) (Bible)
Grad. Relig. 621 (3), 622 (3) (Book of Mormon)

### Doctor of Religious Education Degree

The applicant for this program must have completed two years of successful teaching to be considered for admission. A total of three years' successful teaching is required before the awarding of the degree. The student accepted on a degree-seeking basis as a major in religious education must fulfill the following requirements under the direction of his advisory committee:

A. Attain a minimum of 72 semester hours of approved course work credit, plus 12 hours of dissertation credit.

1. **Service Courses** (16 hours of course work are required in this area. All starred courses are required.)

| Course Title & No. | | Hrs. | Course Description |
|---|---|---|---|
| Grad. Relig. | 670 | 2 | Survey of Religious Education |
| | 570 | 2 | Methods of Teaching Religion in Secondary Schools |
| | 571 | 2 | Methods of Teaching Religion in Secondary Schools |
| | 673 | 2 | Methods of Teaching Religion in College |
| | 674 | 2 | Methods of Teaching Religion in College |
| | 671 | 2 | Curriculum of Religion in Secondary Schools |
| | 675 | 2 | Curriculum of Religion in College |
| | 672 | 2 | Religious Curriculum Building for Secondary Schools |
| | 676 | 2 | Religious Curriculum Building for Colleges |
| Stat. | 501 | 5 | *Statistics for Research Workers |
| Grad. Ed. | 675 | 3 | Organization and Administration |
| | 656 | 3 | Advanced Educational Psychology |
| | 646 | 3 | *Counseling Theory and Practice |
| | 647 | 2 | *Group Techniques for Counselors |
| CDFR | 667 | 2 | Problems of Teaching Marriage and Family Relationships in College |

2. **General Studies** (16 hours of course work are required in this area. All starred courses are required.)

| Course Title & No. | | Hrs. | Course Description |
|---|---|---|---|
| Grad. Relig. | 541 - 544 | 6 | Documents of L.D.S. Church History |
| | 551 or 552 | 2 | Ancient Christian History |
| | 654 | 2 | Reformation and Counter-Reformation |
| | 658 | 3 | Comparative Studies in American Religion |
| Psych. | 654 | 3 | *Dynamics of Religious Behavior |
| Sociol. | 516 | 2 | *Sociology of Religion |
| Grad. Relig. | 555 or 556 | 2 | World Religions |
| Pol. Sci. | 503 | 2 | *Contemporary Political Philosophy |

3. **Scripture Courses** (22 hours of course work are required in this area.)

| Course Title & No. | | Hrs. | Course Description |
|---|---|---|---|
| Grad. Relig. | 501,502,503 | 7 | Old Testament |
| | 510,511,512 | 6 | New Testament |
| | 621,622 | 6 | Book of Mormon |
| | 624,625 | 6 | Doctrine and Covenants |
| | 527 | 3 | Pearl of Great Price |

4. **Scientific Disciplines** (18 hours of course work are required in this area. All starred courses are required.)

| Course Title & No. | | Hrs. | Course Description |
|---|---|---|---|
| Phil. | 381,382 | 4 | Systems of Thinking (deductive and inductive procedures) |
| | 470,471 | 6 | History of Philosophy |
| | 473,594 | 4 | *Scientific Methodology |
| | 483 | 2 | *Epistemology |
| | 591 | 2 | Seminar in Philosophical Analysis |
| Relig. | 435 | 2 | *Problems in Science and Religion |

B. Demonstrate competence in the four areas of emphasis in the course work by passing a comprehensive examination in each area.

C. Write an acceptable dissertation embodying the results of original research, or, execute a field project in religious education.

D. Complete successfully an oral examination of the dissertation or field project report.

### Graduate Religion Courses

(Note: Courses where the semester is not designated are specialized offerings given on demand.)

**501. Analysis of the Old Testament: The Pentateuch and Historical Books.** (3:3:0) F.Su. Sperry

**502. Analysis of the Old Testament: Prophetic Books.** (2:2:0) S.Su. Sperry

**503. Analysis of the Old Testament: Poetic and Wisdom Literature.** (2:2:0) S.Su. Sperry

**510. The Gospels.** (2:2:0) F.Su. R. L. Anderson, Sperry, Turner

**511. Paul's Life and Letters.** (2:2:0) F.Su. R. L. Anderson, Sperry, Turner

**512. The General Epistles and the Apocalypse.** (2:2:0) S.Su. R. L. Anderson, Sperry, Turner

**513. New Testament Times.** (2:2:0) S.Su. R. L. Anderson

**527. History and Doctrines of the Pearl of Great Price.** (3:3:0) F.Su. Andrus, Clark

**530. L.D.S. Theology.** (2:2:0) S.Su. Riddle, Turner

**541. Documents of L.D.S. Church History (1820-1839).** (3:3:0 S.Su. Andrus, Backman, Clark, Larson, Rich

**542. Documents of L.D.S. Church History (1839-1850).** (3:3:0) S.Su. Andrus, Backman, Clark, Larson, Rich

**543. Documents of L.D.S. Church History (1850-1900).** (3:3:0) S.Su. Allen, Larson

**544. Documents of L.D.S. Church History (1900 to present).** (3:3:0) F.Su. Cowan

**546. Social, Economic, and Political Thought of Joseph Smith.** (2:2:0) Arr. Andrus

**551. The Primitive Church.** (2:2:0) F. Nibley

**552. Christianity in the Second and Third Centuries.** (2:2:0) S. Nibley

**554. Martin Luther, Forerunner of the Restoration.** (2:2:0) Arr. Horsley
Luther's life, theology and influence upon Protestant Christianity, with special emphasis upon the significance of Luther for Mormonism.

**555. Comparative World Religions.** (2:2:0) F.Su. Palmer
Hinduism, Jainism, Sikhism, Buddhism.

**556. Comparative World Religions.** (2:2:0) S.Su. Palmer
Taoism, Confucianism, Shintoism, Judaism, Zoroastrianism, and Islam.

**557. Religions of the Ancient Near East.** (2:2:0) F. Nibley

**558. Christian Rites and Liturgy.** (2:2:0) Arr. Nibley

**559. History of Christianity in Asia.** (2:2:0) F. Palmer

**568. Church History Field Trip.** (3:3:3 weeks)

**570, 571. Methods of Teaching Religion in Secondary Schools.** (2:5:0 ea.) Su. W. E. Berrett

**593, 594. Hebrew Grammar and Selected Readings.** (3:3:0 ea.) Sperry

**601. History of the Hebrews.** (3:3:0) F. Sperry

**604. The Literature of the Old Testament.** (2:2:0) S. Sperry

**605. Canon and Text of the Old Testament.** (2:2:0) F. Sperry

**606. The Apocrypha and Pseudepigrapha.** (2:2:0) S. Sperry

**608. Cultural and Religious Patterns of the Ancient Near East.** (2:2:0) S. Sperry

**610. Early Christian Literature.** (2:2:0) F. R. L. Anderson

**611. Formation of the New Testament: Text and Canon.** (2:2:0) Arr. Sperry

**612. Textual Criticism of the New Testament.** (2:2:0) Arr. R. L. Anderson

**621. Analysis of the Book of Mormon (Doctrinal).** (3:3:0) F.Su. Ludlow, Sperry

**622. Analysis of the Book of Mormon (External Evidence).** (3:3:0) S.Su. Ludlow, Sperry

**624. Analysis of the Doctrine and Covenants.** (3:3:0) F.Su. Andrus, Doxey

**625. Analysis of the Doctrine and Covenants.** (3:3:0) S.Su. Andrus, Doxey

**627. Seminar: Pearl of Great Price.** (2:2:0) S. Andrus, Clark

**641. Special Problems in L.D.S. Church History.** (3:3:0) Arr. Andrus, Backman, Larson, Rich

**645. Historical Development of L.D.S. Doctrine and Practices.** (3:3:0) Arr. Andrus, Backman, Larson, Rich

**653. History of the Papacy.** (2:2:0) F. Horsley

**654. Reformation and Counter-Reformation.** (2:2:0) S. Horsley

**658. Comparative Studies in American Religions.** (3:3:0) F.S. Backman

**659. American Religious Thought.** (2:2:0) Arr.

**660. Seminar in History of Asian Religion.** (2:2:0) S. Palmer

**670. Survey of Religious Education.** (2:2:0) S. Belnap

**671. Curriculum of Religion in Secondary Schools.** (2:5:0) Su. Berrett

**672. Religious Curriculum Building for Secondary Schools.** (2:5:0) Su. Prerequisite: Grad. Relig. 671. Berrett

**673, 674. Methods of Teaching Religion in College.** (2:5:0 ea.) Su. Berrett

**675. Curriculum of Religion in College.** (2:5:0) Su. Berrett

**676. Religious Curriculum Building for Colleges.** (2:5:0) Su. Prerequisite: Grad. Relig. 675. Berrett

**677. Problems of Teaching Religion.** (1:3:0) Arr. Berrett

**680. Philosophic Problems and Religious Instruction.** (1:3:0) Su. Riddle, Yarn

**690. Studies in the Hebrew Old Testament.** (3:3:0) Arr. Prerequisite: two years of Hebrew or consent of instructor. Sperry

**691. Studies in Hebrew.** (3:3:0) Arr. Prerequisite: Grad. Relig. 690. Sperry

**693, 694. Biblical Aramaic and the Targums.** (2:2:0 ea.) Arr. Prerequisite: at least one year of Biblical Hebrew. Sperry

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**709. Seminar: Old Testament.** (2:2:0) Arr. Sperry

**710. Seminar: New Testament.** (2:2:0) Arr. Anderson

**711. Readings in Greek: The Gospel and Acts.** (3:3:0) Arr. Prerequisite: one year of Greek or consent of instructor. Anderson, Nibley

**712. Readings in Greek: Paul's Letters.** (3:3:0) Arr. Prerequisite: one year of Greek or consent of the instructor. Anderson, Nibley

**713. Readings in Greek: General Epistles and the Apocalypse.** (3:3:0) Arr. Prerequisite: one year of Greek or consent of instructor. Anderson, Nibley

**721. Seminar: Book of Mormon.** (2:2:0) Arr. Ludlow, Sperry

**724. Seminar: Doctrine and Covenants.** (2:2:0) Arr. Andrus, Doxey

**728. Readings in Modern Scripture.** (1-2:Arr.:Arr.) Andrus

**748. Readings in L.D.S. Church History.** (1-2:1-2:0) Arr. Andrus, Backman, Larson, Rich

**755. Seminar: History of Religion.** (2:2:0) F.S.Su. Andrus, Horsley, Larson, Palmer, Rich

**758. Readings in Christian History.** (1-2:1-2:0) Arr. Nibley

**759. Readings in the History of World Religions.** (1-2:1-2:0) Arr. Nibley

**791. Syriac.** (5:5:0) Arr. Prerequisite: two years Biblical Hebrew or one year Aramaic. Sperry

**792. Syriac.** (3:3:0) Arr. Prerequisite: Grad. Relig. 791. Sperry

**793, 794. Akkadian.** (2:2:0 ea.) Arr. Prerequisite: two years Biblical Hebrew. Sperry

**797, 798. Ugaritic.** (3:3:0 ea.) Arr. Prerequisite: two years Biblical Hebrew. The alphabet, vocabulary, and grammar of the language of the Ras Shamra tablets. Valuable for its parallels to Biblical Hebrew.

**799. Doctoral Dissertation.** (1-6:Arr.:Arr.)

# Sociology and Anthropology

**Professors:** Symons (chairman, 1216A SFLC), Ballif, Bradford, Christiansen, Dyer, Larsen, Smith.
**Associate Professors:** Fitzgerald, Peterson.
**Assistant Professors:** Duke, Matheny, Myers.

### Requirements

The Department of Sociology and Anthropology offers training for the Master of Science degree and the Doctor of Philosophy degree. It is expected that graduate students will acquaint themselves with all the general regulations for advanced degrees as outlined by the Graduate School.

### Master's Degree

The requirements for the master's degree in sociology include, of course, the general requirements of the Graduate School. A complete statement of rules and procedures of the master's degree program in sociology is available from the department chairman or the graduate adviser.

Admission to the master's degree program requires a minimum of 15 semester hours in sociology or its equivalent, including courses in introductory sociology, sociological theory, methods of research, and statistics, and the passing of an oral examination involving the following fields: sociological theory, statistics, research methods, and social organization-disorganization. The screening examination is not more than two hours in length. The examination committee consists of three departmental members of the graduate faculty of the university. One member of which must be the chairman of the student's graduate committee. The examination will be scheduled by the student within two weeks following his first registration provided he has been admitted on a full degree-seeking basis. Provisionally admitted students will take the screening examination within two weeks after they have been admitted on a full degree-seeking basis, if they are in residence, or two weeks after first registration as full degree-seeking student, whichever comes first. The four parts of the examination will be graded by the examination committee. The grades are as follows: high honors, honors, pass, pass with qualification, and fail. No graduate course program or thesis prospectus will be approved until this examination is taken.

The screening examination serves two purposes:

1. It helps to discover those students whose ineptness in the field is such that they should be advised not to continue.
2. It reveals strengths and weaknesses of a given student so that the most meaningful program can be arranged for him.

The week following the examination the student will be notified of his status by his advisory committee chairman. If the student's performance on the examination is such that he is permitted to continue toward his degree, the department reserves the right to examine him again at a later date in the areas in which his test performance was below standard.

The student must satisfactorily complete the following courses: Sociology 524, 597, 690, and two graduate seminars in sociology plus other courses selected by the student in consultation with his advisory committee. Prior to registering for the last 15 semester hours of credit applying toward the degree, the student should file with the Office of the Graduate Dean his graduate course program, and prior to registering for his last semester of work applying toward the degree he should file a prospectus of his thesis. An oral preliminary examination is given the student on the prospectus prior to the collection of the data.

### Doctor of Philosophy Degree

Students intending to enter the doctoral program in sociology should obtain from the department chairman or graduate adviser a complete statement

of rules and procedures. In addition to the general requirements of the Graduate School, a student working toward a doctorate in sociology must fulfill the following specific requirements:

1. **Requirements for Admission.** For admission to the doctoral program in sociology the student must furnish evidence of having received a master's degree or its equivalent in sociology from an accredited university. In addition, the student must pass screening examinations in the following areas: sociological theory, statistics, research methods, and social organization-disorganization. Screening examinations must be taken by the sixth week of the student's first semester of residence. The department may then prescribe remedial work or other requirements as a condition for admission. The student must complete such work with a grade of "B" or better. The screening examination will be an oral examination. See admission information under "Master's Degree" on the preceeding page.

2. **Student's Advisory Committee.** The members of the advisory committee are nominated by the student in consultation with the department chairman and with the approval of the dean of the Graduate School. Four men from the department plus one from outside the department comprise the advisory committee.

3. **Major and Minor Fields.** The student must have two major fields within sociology, one of which must be research methods. A major field is a field of study in which the student specializes both in respect to teaching and research. It is presumably the field in which the dissertation is to be written and upon which the professional career is to be based.

The student must have two minor fields, one of which may be selected from another department in lieu of one of the minor fields in sociology. A minor field is construed as a field of study in which the student may teach and/or conduct research creditably. It is not the substantive field, however, in which his competence is most highly developed.

The major fields must be selected from the following: deviant behavior, social psychology, research methods, social organizations, and sociological theory. With the exception of research methods, the minor fields may be selected from the preceeding and the following: demography, family and rural sociology.

A student may elect to have a minor in a field not listed above. To do so he must submit a proposed program of study to his advisory committee at least 12 months in advance of the comprehensive examinations. This committee, with the approval of the members of the department, may authorize an alternate minor field in sociology.

4. **Comprehensive Examinations.** The student must pass comprehensive examinations after the completion of prescribed course work and at least one year prior to the granting of the degree. Unless a minor is selected in another department, the examinations are in four of the above fields of sociology, two of which must be (a) sociological theory and (b) research methods.

### Requirements for a Minor in Sociology

A student working toward a master's degree completes the departmental requirements for a minor in sociology by satisfactorily completing Sociology 604 plus graduate semester hours in areas related to his major specialization in his field as approved by his advisory committee, a member of which is from the Department of Sociology and Anthropology.

A student working toward the doctoral degree with a major in another department and with a minor in sociology takes a preliminary screening examination, after which a committee member from the Department of Sociology and Anthropology, with the approval of the other members of the department, outlines a program in accordance with the needs of the student.

### Graduate Courses Grouped According to Major-Minor Fields

The following courses are grouped according to the major and minor fields of the doctoral program in sociology. The courses in each field are recommended,

but they must be supplemented by other study as defined by the student's advisory committee. Minimum essential bibliographies for these fields are available.

**Demography**
(minor only)
623

**Deviant Behavior**
(major or minor)
550
591
686

**Family**
(minor only)
560
660

**Research Methods**
(major only)
524
561
597
701

**Rural Sociology**
(minor only)
692

**Sociological Theory**
(major or minor)
690
691
791

**Social Psychology**
(major or minor)
530
542
552
555
630
730
757
792

**Social Organizations**
(major or minor)
512
516
543
551
570
580
626
696

## Courses

501. **Political Sociology.** (3:3:0) F. Prerequisite: Sociol. 111 or consent of instructor.
An analysis of power and decision-making in social groups. Social bases of government and political behavior. Relationship of governmental institutions to other societal institutions.

512. **Sociology of Education.** (2:2:0) S. Smith
Analyzes principles of sociology of education and their implication for theory and practice of school administration, curricula, and methods of instruction.

516. **Sociology of Religion.** (2:2:0) F. Larsen
Analyzes influences of social factors in development of various religious systems.

524. **Advanced Social Statistics.** (3:3:0) F. Prerequisite: Sociol. 220, or consent of instructor. Christiansen
Advanced course designed for those who intend to do research or continue in graduate work.

530. **(Sociol.-Psych.) Theory and Research in Social Psychology.** (3:3:0) S. Prerequisite: Sociol. 350 or Psych. 350.
A survey, in depth, of current theory and research in social psychology, with emphasis on understanding the individual in his interpersonal interaction.

542. **Social Movements.** (2:2:0) S. Payne
Discuss social aspects of various movements from Adam Smith to John Dewey with special emphasis on social reform movements in the United States.

543. **Social Legislation.** (2:2:0) S. Ballif
Basic problems and techniques of social legislation. Analyzes various systems now in operation.

550. **Social Aspects of Physical Disability.** (3:3:0) S. (m) Peterson
Human relationships and social interaction in the life of the physically handicapped, plus the study of special governmental and social agency attention to their needs and well-being.

551. **Sociology of Recreation.** (2:2:0) S.Su. Payne
Treats relations of recreational interests to growth, group behavior, and social maladjustments. Emphasizes basic theories of recreative activities.

552. **Personality: Culture and Society.** (3:3:0) F. Prerequisite: Sociol. 111 or Psych. 111. Christiansen, Dyer

555. **(Sociol.-Psych.) Group Dynamics.** (3:3:0) S. Prerequisite: Sociol. 350. Dyer
Analyzes research and theories of group dynamics.

560. **The Family Institution.** (2:2:0) S. Prerequisite: Sociol. 403. Bradford, Christiansen
Emphasizes the family in several different societies and problems created by various family systems.

561. **Contemporary Sociological Research.** (2:2:0) S. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor.

570. **Class, Status, and Power.** (3:3:0) F. Prerequisite: Sociol. 111, or consent of instructor. Duke
Analyzes the major status and class systems in various societies. Also discusses power relations in such systems.

580. **Social Relations in Medical and Health Organizations.** (2:2:0) S. (m) Peterson
Analyzes the structure of medical and health organizations. Designed for premedical, predental, health education, and nursing students.

591. **Seminar in Crime Causation and Treatment.** (2:2:0) F.SU. Prerequisites: Sociol. 111, 380. Smith, Symons
Considers the major causes of crime and analyzes prevalent theory and techniques of treatment of criminals.

595. **Directed Readings.** (1-3:0:2-6) F.S.Su.
Readings in special areas.

596. **Directed Readings.** (1-3:0:2-6) F.S.Su.
Readings in special areas.

597. **Advanced Research Methods.** (3:3:0) S. Prerequisite: Sociol. 397 or consent of instructor. Peterson
Analyzes methods used in investigation of sociological data. Field projects give the student actual experience in research.

623. **Demographic Analysis.** (3:3:0) S. Prerequisite: Sociol. 420. Fitzgerald
The discipline of demography, with its special methods and procedures will be analyzed. Major current research in the field will receive careful coverage.

626. **Contemporary Urban Social Structure.** (3:3:0) S. Prerequisite: Sociol. 426, or consent of instructor. Fitzgerald, Smith
This course will be a research oriented examination of social forces in contemporary urban life which influence patterns of human interaction.

630. **(Sociol.-Psych.) Attitude Change.** (3:3:0) F. Prerequisite: graduate standing or consent of instructor.
An examination of various theoretical approaches to the study of attitude development, change, and assessment, including a focus of both individual and mass persuasion.

660. **Familial Role Structure.** (3:3:0) S. Prerequisite: Sociol. 403. Bradford
Analysis of the various roles in the family, with their attendant characteristics and problems, in various societies, but particularly in the United States.

686. **Problems in Race Relations.** (2:2:0) F. Prerequisite: Sociol. 410. Ballif
Considers significant problems of a specialized nature in the field of race relations.

**690. Seminar in Contemporary Sociological Theory.** (2:2:0) F.Su. Prerequisites: Sociol. 404 and 405. Bradford, Dyer
An advanced course in sociological theory.

**691. Seminar in Sociological Theory Building.** (2:2:0) S. Prerequisites: Sociol. 404, 405, and 690. Bradford, Duke, Dyer
An advanced course in sociological theory building.

**692. Seminar in Problems of Rural Society.** (3:2:1) F. Prerequisite: Sociol. 423 or consent of instructor. Christiansen
Field type training, with on-the-job contacts with county agents, et. al. Findings from these contacts will be the classroom material.

**694. Directed Research.** (1-3:0:2-6) F.S.Su.
Research in special areas.

**696. Seminar in Industrial Sociology.** (3:3:0) S. Prerequisite: Sociol. 446. Dyer
Designed to give added insight by careful attention to current trends in industry, labor-management developments, government, participation, etc.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

**701. Advanced Statistical Methods.** (2:2:0) S. Prerequisites: Sociol. 220, 524, and consent of instructor. Peterson
Consideration of advanced statistical techniques such as scalogram analysis, factor analysis, and latent structure analysis.

**730. (Sociol.-Psych.) The Consultative Process.** (3:2:2) (Offered alternate years) Prerequisite: Psych. 357.
Nature of the consultative relationship. Essential elements involved in consultation, forces operating in consultation relationship, developing effective strategy for consultation.

**757. (Sociol.-Psych.) Practicum in Group Development.** (3:1:4) Prerequisites: Graduate standing in psychology or sociology; Sociol. 357, 555, consent of instructor.

**791. Seminar: Social Organization.** (2:2:0) F. Prerequisites: Sociol. 111, 405, and consent of instructor. Dyer
Comprehensive examination of major theories of organization with emphasis upon theory construction.

**792. Seminar: Social Psychology.** (2:2:0) S. Prerequisites: Sociol. 350, and consent of instructor. Larsen
Designed to give advanced work to graduate students. Gives special emphasis to group processes and socialization.

**796, 797. Special Research Problems.** (1-3:0:2-6 ea.) F.S.Su.

**799. Dissertation for Ph.D.** (Arr.) F.S.Su.

# Speech

**Professors:** Bateman, Low, Morley.
**Associate Professor:** Clinger (chairman, F-574 HFAC).

### Requirements

The Department of Speech offers training for the Master of Arts degree in the area of public speaking and the Master of Science degree in the area of speech pathology. In both areas a thesis is required.

During the first semester of graduate study, candidates for the master's degree must pass a written test to demonstrate proficiency in background in the area in which they elect to major.

It is expected that graduate students will acquaint themselves with all the general regulations for advanced degrees as outlined by the Graduate School.

Under the direction of the chairman of the special committee, the candidate must complete a scholarly paper or monograph outside the regular class research.

Following are divisions of courses in speech:

**Public Address:** 523, 524, 525, 527, 590, 601, 621, 622, 623, 624, 643, 692, and 699. 401 and 402 may be counted in this field in harmony with general regulations of the Graduate School.

**Speech Pathology and Audiology:** 543, 544, 546, 547, 550, 551, 561, 640, 641, 643, 646, 647, 648, 656, 657, 660, 661, 662, 693, 694, 695, 699.

## Courses

523. **Rhetorical Theory.** (2:2:0) F.Su. (m) Bateman, Brown, Jenson

524. **High School Forensics and Programming.** (1-2:1-2:1-6) Su. Bateman, Boren

525. **Debate Coaching.** (1-2:1-2:0) F.S.Su. Boren, Richardson
Designed for prospective debate coaches. Covers debate techniques and how they are taught.

527. **Storytelling.** (2:2:0) F.S.Su. (m) Clinger
Art of storytelling. Especially valuable to teachers and youth leaders.

543. **Advanced Studies in Stuttering.** (2:2:0) F.Su. (Offered odd years) Morley
The consideration of theories, etiology, and current research in the nature and therapies used in treatment of this speech disorder.

544. **Advanced Studies in Voice.** (2:2:0) F.Su. (Offered even years) Low
A study of the description physiology, etiology, management, treatment and re-education of voice disorders.

546. **Advanced Studies in Cerebral Palsy.** (2:2:0) F.Su. (Offered odd years) Jex
Study of the incidence, etiology, appraisal, and procedures for speech and hearing therapy of the individual with cerebral palsy.

547. **Psychology of Communication Disorders.** (2:2:0) F.Su. Jex
Study of speech perception, comprehension, dynamics, semantics, and symbols as related to communication disorders.

550. **Speech Science.** (2:2:1) F.S.Su. (m) (Offered odd years) Prerequisite: Physics 100. Low
An investigation into the basic process underlying oral communication through experiment and instrumentation.

551. **Anatomy and Physiology of Speech and Hearing Mechanism.** (2:2:0) F.S.Su. (Offered even years) Prerequisites: Zool. 105, 261, 263, or consent of instructor. Low
Special emphasis will be given to the anatomy and physiology related to the processes of communication including hearing, perception, conceptualization, symbolization, phonation, and articulation.

561. **Hearing Aids and Instrumentation.** (2:2:1) F.Su. (Offered even years) Prerequisite: Speech 363. Weaver
Designed to acquaint students in speech, hearing, and related fields with basic designs, operation, selection, and use of hearing aids of all types for individuals with impaired hearing.

590. **Selected Reading and Projects in Public Address.** (1-2:0:0) F.S.Su.
Opportunity for expression of independent research and experimental work in special reading and public address projects over and beyond or outside of usual thesis work.

**601. Psychology of Public Address.** (2:2:0) S. Prerequisites: Speech 101, 401, or 403. Boren, Jenson

Advanced study of the psychological elements connected with audience thinking and style of speaking and composition commensurate with persuasion.

**621. Ancient Rhetoric and Oratory.** (3:3:0) F.Su. (Offered odd years) Brown

**622. British Public Address.** (3:3:0) S.Su. (Offered even years) Bateman, Brown

**623. American Public Address.** (3:3:0) F.Su. (Offered even years) Bateman, Clinger

**624. Contemporary Public Address.** (3:3:0) S. (Offered odd years) Bateman, Richardson

**640. Internship in Advanced Methodology and Clinical Practicum in Speech Pathology.** (1-2:1-2:0) F.S.Su.

This internship may be completed, under proper supervision, at university clinics, in hospitals, community clinics, schools, etc. located locally or in other cities and states.

**641. Internship in Advanced Methodology and Clinical Practicum in Audiology.** (1-2:1-2:0) F.S.Su.

**643. Methods and Problems of Research in Speech.** (2:2:0) F. Low, Jenson

Required of all graduate students. It is imperative that students take this course early in their graduate program.

**646. Oro-Facial Communication Disorders.** (2:2:1) F.Su. (Offered odd years) Morley

Study of communication disorders associated with anomalies of palate, teeth, tongue, maxilla, mandible.

**647. Oral Communication of the Mentally Retarded.** (2:2:1) F.S. (Offered odd years).

Advanced studies of the communication disorders of the mentally retarded. Principles and procedures of communication habilitation designed for speech and hearing and special education majors and other school specialists.

**648. Advanced Studies in Aphasia.** (2:2:0) S.Su. (Offered even years)

Nature, etiology, diagnosis, and therapy associated with the speech of child and adult aphasics (brain damaged), will be studied; also linguistic, behavioral, and intellectual changes.

**656. Special Projects in Speech Pathology.** (1-4:1-4:0) F.S.Su.

**657. Special Projects in Audiology.** (1-2:1-2:0) F.S.Su.

**660. Clinical Audiology.** (2:2:2) S.Su. (Offered odd years) Prerequisite: Speech 363. Morley

The theoretical basis and development of skill in the techniques of administering new and advanced audiometric procedures in the assessment of impaired hearing.

**661. Community and Industrial Audiology.** (2:2:1) F.Su. (Offered even years) Weaver

Study of hearing problems in industry, legal implications, hearing, testing of adults, and adult hearing rehabilitation.

**662. Pediatric Audiology.** (2:2:1) S.Su. (Offered odd years) Prerequisite: Speech 363. Weaver

Principles and procedures of audiometry and other audiologic evaluations of preschool and school age children.

**692. Seminar in Public Speaking.** (1-3:1-3:0) F.S. Bateman

**693. Special Studies in Speech Pathology.** (1-3:1-3:0) F.S.Su.

**694. Special Studies in Audiology.** (1-2:1-2:0) F.S.Su.

**695. Seminar in Psychoacoustics of Speech and Hearing.** (3:3:0) S.Su. (Offered even years)
A study of the acoustic nature of speech and hearing intelligibility, characteristics of speech waves, frequency of occurrence of different speech sounds, and experimental phonetics.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

# Statistics

**Professors:** Carter, Nielson.
**Associate Professor:** Richards (chairman, 348 JKB).
**Assistant Professors:** Burton, Eager, Faulkner, Hilton.

The Department of Statistics offers courses leading to the Master of Science degree in statistics for students who are (1) preparing for work in industry or government; or (2) preparing for additional study and research in statistics at the Ph.D. level.

### Requirements

The graduate student is expected to satisfy all the general requirements for a Master of Science degree outlined by the Graduate School.

A student will be required to complete 27 approved semester hours exclusive of thesis of which a minimum of 18 hours must be in the Department of Statistics. If six semester hours of advanced calculus have not previously been completed, the above 27 hours must include six hours of advanced calculus. Students should have at least completed mathematics through integral calculus before entering the program. Those failing to meet this requirement can expect to take more time in completing the degree requirements.

Statistics 501 is available for those students with no previous training in statistics and may be completed during the summer preceding enrollment. This course will not count toward a degree. The student must include 621 and either 631 or 636 in his program.

### Courses

**501. Statistics for Research Workers.** (5:4:3) F.S.Su. Prerequisite: Math. 105 or equivalent. Carter, Hilton
Probability, estimation, confidence intervals, tests of hypotheses, regression, analysis of variance and nonparametric methods. Designed for graduate students in the natural or social sciences.

**511. Advanced Computer Methods in Statistics.** (3:1:6) F. Prerequisites: Math. 311 or Acctg. 456, Stat. 330 or 336, or 501. Carter
Application of digital computers to statistical problems including analysis of variance, multiple regression, analysis of covariance, factorial experiments, response surfaces, Monte-Carlo simulation, linear programming, etc.

**522. Theory of Linear Models.** (3:3:0) S. Prerequisites: Stat. 421, and at least concurrent registration in Stat. 422. Nielson, Richards
A study of generalized linear hypotheses with application regression and experimental design.

**531. Experimental Design.** (3:3:0) F. Prerequisites: Stat. 330, 336, or 501. Carter Hilton.
Randomized blocks, Latin squares, factorial designs, fractional replication, confounding and incomplete blocks.

**534. Sampling.** (3:3:0) S. Prerequisite: Stat. 336 or equivalent. Nielson
Systematic, sample random, stratified and cluster sampling, optium allocation, ratio estimation, etc. Applications to various fields.

**541. Advanced Probability.** (3:3:0) F. Prerequisite: Math. 113. Recommended: completion of or concurrent registration in Stat. 421. Burton, Faulkner
Recurrent events, runs and sequences, advanced combinatorial methods, random walk, queuing and Monte Carlo methods; introduction to Markov chains and sequential processes.

**591, A,B. Graduate Seminar in Statistics.** (1-2:1:0 ea.)

**621, 622. Advanced Theory of Statistics I, II.** (3:3:0 ea.) F.S. Prerequisites: Math. 542, Stat. 422. Recommended: Stat. 522. Faulkner, Nielson
Advanced topics in the theory of estimation, testing hypotheses, multiple regression, multivariate analysis.

**623. Analysis of Variance.** (3:3:0) F. Prerequisites: Stat. 422, Stat. 522 or equivalent. Nielson
Theory of analysis of variance for fixed effects, random effects and mixed models including two-three and higher-way layout, Latin squares, incomplete blocks and nested designs.

**631. Advanced Experimental Design.** (3:3:0) S. Prerequisites: Stat. 422, 531. Recommended: Stat. 522. Carter, Nielson
Advanced topics in experimental design including the general p-level factorial, Youden squares, balanced incomplete blocks, response surfaces, lattice design.

**632. Advanced Industrial Statistics and Reliability.** (3:3:0) S. Prerequisites: Stat. 422, 432 or equivalent. Richards
Advanced topics in sequential sampling, tolerance limits, life testing and reliability.

**636. Advanced Statistical Methods.** (3:3:0) F. Prerequisite: Stat. 336, 422, and/or 501. Carter, Richards
Advanced topics in estimation, confidence intervals, tests of hypotheses including distribution-free methods, truncated distributions, order statistics.

**641. Advanced Topics in Probability I.** (3:3:0) F. Prerequisites: Math. 542, Stat. 422, 541. Burton
Advanced topics in Markov chains, Stochastic processes and information theory.

**642. Advanced Topics in Probability II.** (3:3:0) S. Prerequisites: Math. 542, Stat. 541, 621. Recommended: Stat. 641, Math. 641. Burton
A measure theoretic approach to probability including Borel sets, characteristic functions, measure spaces, measurable functions, etc.

**690, A,B. Special Topics in Statistics.** (3:3:0 ea.) F.S.Su. Prerequisite: consent of instructor.
Specialized topics in statistics varied from time to time.

**695. Reading in Statistics.** (1-2:1-2:0) F.S.Su. Prerequisite: consent of department.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Prerequisite: consent of department.

# Zoology and Entomology

**Professors:** Allen (chairman, 280 B), Beck, Hayward, V. Tanner, W. Tanner.
**Associate Professors:** Allred, Chapman, Frost, Murphy, Wood.
**Assistant Professors:** Braithwaite, Egbert, Jaussi, Jorgensen.

### Requirements for Graduate Degrees

A prospective graduate major is expected to satisfy all general requirements for advanced degrees as outlined by the Graduate School. The responsibility for compliance with these regulations rests with the student. The student will be carefully screened during his first year of residence in order to insure that he possesses adequate breadth of training to do academic and research work at the graduate level. Principal points of consideration will be these:

1. A careful appraisal of undergraduate and graduate transcript records will be made by the Graduate Standards Committee of the Department of Zoology and Entomology.
2. A series of selected oral and/or written examinations will be given. These examinations must be taken by the student during the first semester of his graduate studies on degree-seeking (full or provisional) status.

All graduate students who major in the department will complete the courses 510, 680 and graduate seminars 696, 697. Students who elect to obtain a minor in the department will be required to have at least six semester hours of credit in selected course work taught in the department at B.Y.U. The above six hours will be in addition to any credit hours accepted by transfer from an accredited university and which are part of his graduate program.

The student's advisory committee is composed of members from the major and minor departments. They will counsel, guide and report to the department the progress of the student during the entire period of his graduate studies. As early as the end of the first semester and no later than the second, the student will be informed of his status at the degree-seeking level in the Department of Zoology and Entomology. Such recommendations as are necessary will be sent to the dean of the Graduate School.

### Graduate Degrees

The Department of Zoology and Entomology offers work leading to the Master of Science and Doctor of Philosophy degrees in zoology or in entomology. A student may pursue research work in specific areas of zoology or entomology in such fields as anatomy, ecology, embryology, genetics, histology, morphology, natural history, parasitology, physiology, radiation biology, and taxonomy. Either one or two minors may be selected, and it is recommended that at least one minor be chosen from a department other than zoology and entomology.

Under the Doctor of Philosophy program, the student is expected to spend a period of time off campus in approved laboratory or field studies. A student seeking a master's degree in a natural history area will generally be expected to fulfill this requirement also. Students in other areas of zoological science may, at the discretion of the advisory committee, be asked to participate in extended periods of off-campus field or laboratory experience as a prerequisite for the master's degree.

### Courses

**510. Zoological Literature.** (2:1:2) F. Wood
An introduction to the literature of zoology designed to prepare the student for research and thesis writing.

**531. Insect Physiology.** (2:1:2) S. (Offered 1967-68 and alternate years) Wood

**533. Field Entomology.** (2:0:4) Su. Prerequisite: Zool. 332. Wood

**538. Immature Insects.** (2:0:4) S.

540. **Aquatic Ecology.** (3:2:3) F. Prerequisite: Zool. 451 or Bot. 450. Murphy

555. **Principles of Zoogeography.** (2:2:0) F. (Offered 1967-68 and alternate years) W. Tanner

561. **Advanced Vertebrate Anatomy.** (3:1:4) F. (Offered 1967-68 and alternate years) Prerequisite: Zool. 363. W. Tanner

562. **Advanced Vertebrate Anatomy.** (3:1:4) S. Prerequisite: Zool. 363. Chapman

563. **Etiology and Educational Implications of Brain Injury.** (3:2:2) S.Su. Prerequisite: consent of instructor. Chapman

564. **Neurology.** (2:1:2) S. Prerequisite: consent of instructor. Chapman

565. **Endocrinology.** (3:3:0) S. (Offered 1967-68 and alternate years) Prerequisite: Zool. 465 or equivalent. Jaussi

567. **Cell Physiology.** (3:3:0) S. Prerequisite: Zool. 108; organic chemistry. Egbert

573. **Experimental Embryology.** (2:1:3) S. (Offered 1967-68 and alternate years) Prerequisite: Zool 373. Allen

578. **Radiation Biology.** (2:2:0) F. (Offered 1967-68 and alternate years) Prerequisites: Chem. 106 or 112; Physics 202; Zool. 465. Recommended: Physics 303. Allen

579. **Radiation Biology Laboratory.** (2:0:6) F. (Offered 1967-68 and alternate years) Prerequisite: concurrent registration in Zool. 578. Allen

591. **Special Problems in Zoology.** (1-2:Arr:Arr.) F.Su.

592. **Special Problems in Zoology.** (1-2:Arr.:Arr.) S.Su.

594A,B. **Seminar in Genetics.** (2:2:0 ea.) F. (Offered 1966-67 and alternate years) Prerequisite: Zool. 376 or Bot. 376. Allen

595. **Seminar in Molecular Biology and Biophysics.** (1:1:0) S. Prerequisite: consent of instructor. Egbert

610. **Systematic Zoology.** (2:1:2) S.

612. **Advanced Invertebrate Zoology, I.** (3:2:3) F. (Offered 1966-67 and alternate years) Prerequisite: Zool. 212 or consent of instructor. Braithwaite

613. **Advanced Invertebrate Zoology II.** (3:2:3) S. (Offered 1966-67 and alternate years) Prerequisite: Zool. 612 or consent of instructor. Braithwaite

621. **Arthropodology.** (2:1:3) F. (Offered 1967-68 and alternate years) Prerequisites: Zool. 212, 230. Allred

624. **Acarology.** (2:0:5) F. (Offered 1966-67 and alternate years) Allred

625. **Advanced Topics in Medical Entomology.** (2:0:4) S. Prerequisites: Zool. 332, 433. Allred, Beck

628. **Ecology of Animal Parasites.** (2:2:0) S. (Offered 1966-67 and alternate years) Prerequisites: Zool. 417, 433, 451. Allred

635. **Biological Control of Insects.** (2:2:0) F. (Offered 1966-67 and alternate years) Prerequisites: Zool. 230, 451. Recommended: Zool. 334. Jorgensen

639. **History of Entomology.** (1:1:0) F.

643. **Advanced Ichthyology.** (2:1:2) S. (Offered 1967-68 and alternate years) Prerequisite: Zool. 343. V. Tanner

645. **Advanced Herpetology.** (2:1:2) S. Prerequisite: Zool. 345. W. Tanner

**650. Animal Communities.** (2:2:0) S.Su. Prerequisite: Zool. 451 or Bot. 450. Hayward, Murphy

**662. Advanced Physiology.** (2:1:2) F. Prerequisite: Zool. 465 or consent of instructor. Jaussi

**663. Advanced Physiology.** (2:1:3) S. Prerequisite: Zool. 465 or consent of instructor. Jaussi

**670. Advanced Histology.** (2:0:4) F. Prerequisite: Zool. 370. Chapman

**680. Theoretical Zoology.** (2:2:0) F. (Offered 1966-67 and alternate years) Prerequisite: consent of instructor. W. Tanner

**690A,B. Advanced Topics in Animal Ecology.** (2:2:0 ea.) F. Prerequisite: Zool. 451. Murphy

**691A,B,C,D. Research.** (1-4:Arr.:Arr. ea.) F.S.Su.

**694A,B. Advanced Topics in Ornithology or Mammalogy.** (2:2:0 ea.) F. (Offered 1967-68 and alternate years) Prerequisites: Zool. 346, 347. Frost, Hayward

**695A,B. Seminar in Embryology.** (2:2:0 ea.) S. (Offered 1966-67 and alternate years) Allen

**696, 697. Graduate Seminar.** (1:1:0 ea.)F.S.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

**797A,B,C,D. Research.** (2-4:Arr.:Arr. ea.) F.S.Su.

**799. Dissertation for Ph.D. Degree.** (Arr.) F.S.Su.

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